

THE IRON AGE

THURSDAY, DECEMBER 22, 1892.

The Conradson Lathe.—I.

During the half century which has elapsed since the introduction of the engine lathe the actual process—using the term specifically—of metal turning has remained unchanged—that is to say, the broad principles involved in the two distinct, though independent, elements of cut and feed are practically the same as those originally employed. We may go even further and say that the engine lathe was, to all intents and purposes, merely an improvement in the means for performing the same functions as were previously accomplished by the crude appliances of an earlier date. A machinist need not be such a very old man but that, in the reminiscences of his earlier shop experience, he may have a vision of the old-fashioned hook tool and the laborious method of

guards the workman, it can hardly be applied to the tools, as the chips from the hook tool in skillful hands are of precisely the same character as those produced by the modern engine lathe. The first step in the way of improvement over the hook tool, or more correctly, in the manner of using it, was in providing means for a less laborious and tedious method of manipulation. This consisted in substituting for the stationary rest and the tool movable thereon, a tool held rigidly in a movable (sliding) rest, and providing the latter with independent screws for operating both the cut and feed—that is, for giving the transverse and longitudinal motions necessary for the two functions. Of course the improvement of details in the construction of both rest and tools followed rapidly, and the application of a self-feeding device to the rest gave us the engine lathe. This, in its original form,

more recent competitor, no matter how ingenious or efficient it might be. It is also true, however, that there are many varieties of lathe work which may be more advantageously performed by a machine embodying functions so radically different as to constitute a new departure. The turret screw machine is an instance of this kind. Its product, while substantially the same as the screws formerly turned and chased in the engine lathe, is produced far more cheaply and rapidly than was possible by the latter, requiring less skill in the operator and consequently a much cheaper class of labor.

That the capabilities of the Conradson turret lathe, built by the Gisholt Machine Company of Madison, Wis., render it applicable in a large variety of work in which previously existing and commonly used facilities only were employed, without a thought of questioning their ample

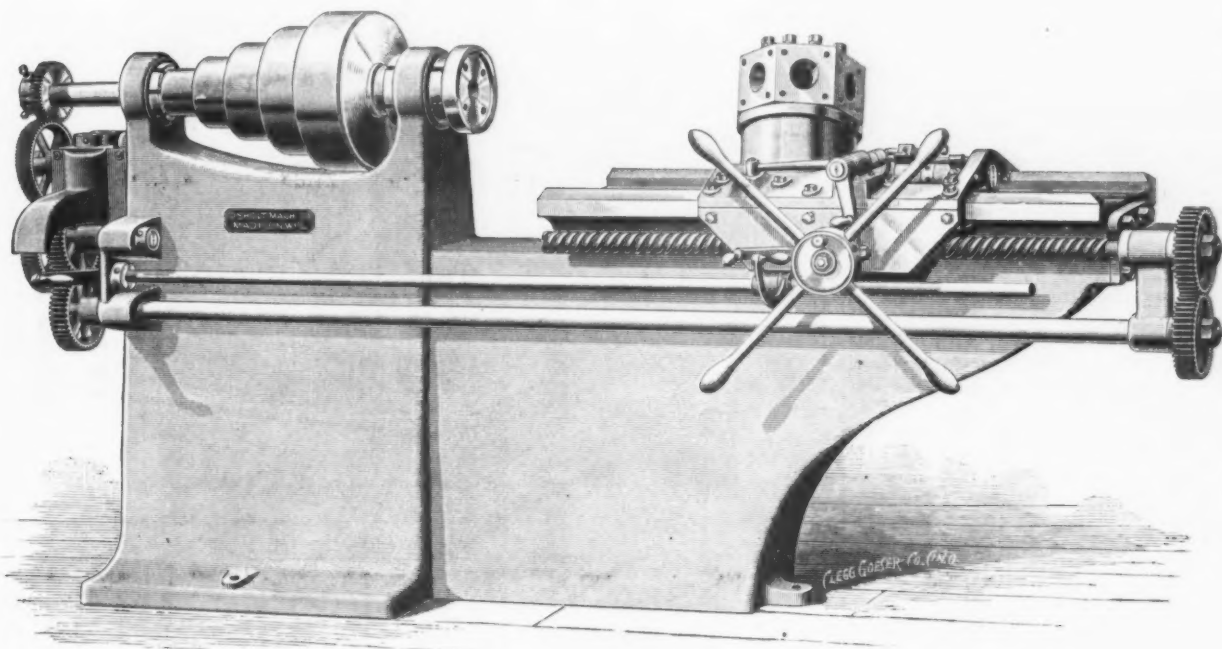


Fig. 1.

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using it. He will recollect that the roughing cut, for instance, was made by a tool practically the same as the modern diamond-point rest tool, and that in using it, it was first held firmly to the work until the desired depth of cut was reached and then fed along at a uniform rate of movement for each revolution of the lathe. The heel of the tool was supported by the rest and formed the fulcrum of a lever, the short arm of which was the tool point and the long arm the handle, which, passing under the arm of the operator and being firmly grasped in both hands, was held with considerably more rigidity than might be imagined. For heavy roughing the tool was usually provided with a supplementary handle resembling that of a paver rammer, attached at a right angle to the main handle, as close as possible to the rest, by which a better control of the tool was had through the increased leverage afforded in the twisting motion necessary in feeding and resisting the strain of cutting.

While the old saw that "you can tell a workman by his chips" may be true as re-

would appear very crude as compared with the improved modern tool, the capabilities of which—by reason of the ingenuity devoted to its development—may be considered as almost unlimited as to the varieties of work, rotative and even reciprocating, commonly performed by it.

The high class engine lathe of to-day, however, even its most improved form, is designed for the performance of work by the two distinct functions of cut and feed. To the large majority of experts it is probable the idea never occurred that the method was not all that could be desired—that it might be capable of improvement, as a method, or that there might be a substitution embodying radically different principles of operation which could in any sense be regarded as a really improved method. It is undoubtedly a fact that there are many varieties of metal turning which will continue to be done as at present until the end of the chapter, and that the engine lathe has come to stay. Its range of usefulness is too great to admit of the probability, at least, of its ever being relegated to the background by any

efficiency, is a fact which must promptly be acknowledged upon investigation by those capable of intelligent judgment in matters mechanical. A peculiar feature of the device is that the broad principle involved in its operation is directly opposed to those upon which our accepted practice is based; and, were it suggested as an abstract proposition, would be voted, almost unanimously, as impossible of adaptation to practical operations, at least on the scale of size to which the actual demonstration shows it to be applicable. Broadly stated, the characteristic principle of the machine, or rather its peculiar method of operation, is not new, as it has been used to a limited extent—on a small scale only, however—in connection with some classes of work on the turret lathe. But that its present successful application is new seems to be sufficiently demonstrated from the fact that its capabilities would have rendered it rather a difficult matter to keep hidden.

As the subject may be considered, in the fullest sense of the term, a new departure in metal turning, its importance demands a more detailed description than would be

possible in this issue, particularly as numerous illustrations of the machine and specimens of its work will be necessary. The lathe is made in three styles, as shown by the cuts, in perspective elevation. Fig. 2 is the plain lathe with turret carriage only. Its swing is limited to the distance of center above the ways. As in the ordinary lathes, the feed screw is driven directly from end of spindle by the train of gears, which, in common with the other two styles, are made changeable to give different pitches of feed. Fig. 1 shows a machine of the same general type, but having a gap to increase the swing over bed. It will be noticed that the feed is a modification of that shown in Fig. 2. The rod shown as transmitting the motion from head gearing to feed screw at tail end of machine is rendered necessary to avoid the twisting tendency of the screw upon the turret carriage, which would have resulted had its nut in the apron been sufficiently low to enable the screw to clear the gap.

These two styles are made only for such work as does not require slow speeds and great power—the back gearing therefore being unnecessary. The cones, however, have five changes of speed, and are made of unusually large diameters and broad faces, and are, therefore, more powerful than those of the ordinary engine lathe of equal size. In Fig. 3 is shown the style of the larger sizes of lathe. It will be observed that, in addition to the turret carriage, there is also a rest carriage, having four tool posts and power cross feed. The head is provided with back gears which, like the cones, have very broad faces, and the pitches of teeth are made as fine as is consistent with strength, to insure smooth motion. A noticeable feature in the construction of all sizes of the machines is that the bed, ways and head are combined in a single casting. The design is symmetrical, and being of the cored section, with internal ribs at points of greatest strain, gives a maximum strength and rigidity for the ample amount of metal employed. The continuous base gives large bearing surface on the foundation, and prevents any possibility of springing or want of stiffness in the ways under the sometimes tremendous strain of the cut. The carriages for both turrets and rest are likewise very heavy, and provided with bearings having an unusually large amount of surface. The carriages are gibbed down to the ways by means of adjustable shoes, and there is also an adjustable bearing at the back to receive the forward thrust of the work against the rest tools, which in some kinds of work is very great. The ways are of the truncated V form, having the bearings relieved on the top or flat, and using the angular faces only. In the three smaller sizes of lathe the spindles are made from mild steel forgings, while for those of the two larger they are of charcoal cast iron. All are hollow, as is usual with turret lathes of the ordinary type.

The working end of the spindle is provided with a self-acting chuck for use in rod or bar work, which was specially designed for the machine, and may be actuated either automatically or by hand. When it is desired to use the machine as an engine lathe it is only necessary to remove the bar chuck from the end of the spindle, screw on the face plate and insert centers—the dead center in one of the sockets of turret—using the latter as poppet head or tail stock. For chucking large work any of the standard makes of chucks may be used, one of which is usually furnished with the machine, the size being as large as the swing over bed will admit.

In the design of the turret there are several novel features, the most noticeable being that it is inclined backward from the vertical at a considerable angle. The object of this arrangement is not apparent at first glance, though, from the nature of

some classes of work done by the machine, it is absolutely necessary to enable the long tools employed to clear parts with which they would conflict were their plane of rotation horizontal. For instance, it will be seen that the handles of a feed ing spider could not be made long enough to answer their purpose were the turret

important factors in the efficiency of the lathe. They will be shown in detail in their proper order.

The capacities of the several sizes of machines are given as follows: The hollow spindles are made for 1 inch, 1½ inches, 2 inches, 3 inches and 4 inches, round bars. The swing of lathes shown in Figs. 2 and

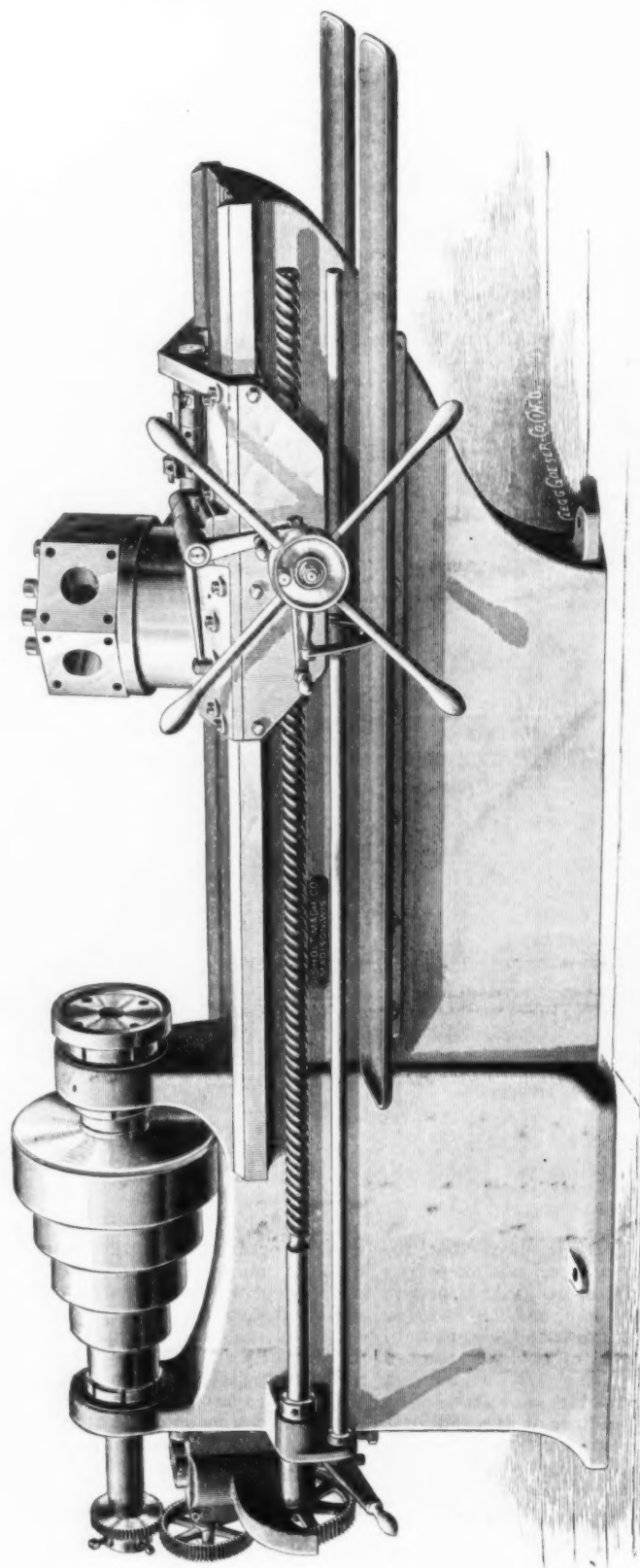


Fig. 2.

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vertical and carrying tools sufficiently long to project as far as the position of spider. The hexagonal form is given the turret head for the purpose of affording large bearing surfaces, to which are bolted such of the tools as cannot be held with sufficient rigidity by the sockets alone. These tools, it will be seen as our description progresses, constitute one of the most

3 is 12 inches, 18 inches, 21 inches, 24 inches and 30 inches, respectively. Those with gap, as shown in Fig. 1, are 20 inches, 30 inches, 36 inches, 42 inches and 50 inches. Fig. 3 is also made with gap, and of capacities last named.

The foregoing general description has been purposely somewhat superficial, as the important features will all be given in

detail, with the necessary drawings. Before proceeding with that portion of the subject, however, we may consider in a general way the principle of operation, in which the machine differs from the ordinary type of engine lathe. Briefly, it is the use of forming tools in a manner and on a scale of size unprecedented in modern

from the slide rest, and a plate of the required form bolted securely in its place. In this plate are seated the several cutters necessary for the different surfaces to be turned. The cutters are in duplicate, the leading ones performing the roughing cut, while those behind are reserved for the comparatively light duty of finishing.

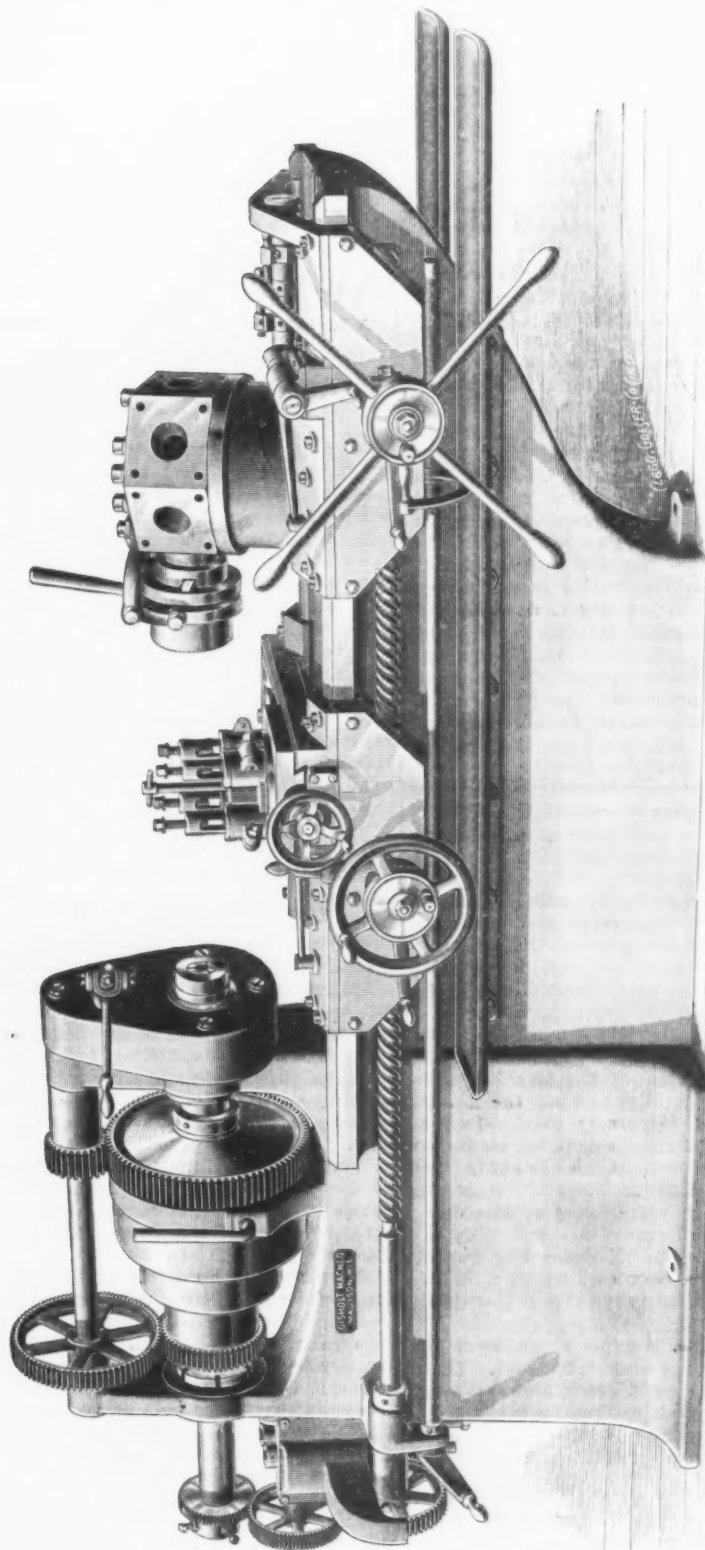


Fig. 3.
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practice. This may be realized when we state that large cone pulleys are turned, perfectly true and smooth, at a single cut. That is, the faces (crowned or straight), sides of steps, flanges—in fact, all surfaces which are ordinarily turned while on the mandrel—are finished as described, at one operation, by a single passage of the tools under the pulley. For this class of work the tool-post attachment is removed

The latter do not engage the work until the roughers have nearly or quite finished their cut, but there is no interruption of the feed, which continues until the finishing cut is completed. The cutters are hardened with temper undrawn, and appear to suffer very little from this apparently severe usage. When grinding becomes necessary, however, it may be done without in the least altering their form.

In order to arrive at an adequate appreciation of this performance let us compare with it the ordinary method of performing the same work on the engine lathe. First, then, we set in the tool post our roughing tool for squaring one side of hub, flanges and steps, which usually will require the tool to be reset for each. Then the work is turned end for end on the centers and the other side surfaces turned. The lathe must then be set taper, one way, either by means of taper attachment, if there be one, or if not by setting over the dead spindle. Then one-half of the crown face is rough turned on each of the speeds or steps; the tool changed and the finishing cut run over the same surfaces. The taper setting must next be reversed to give the proper angle of second half of crown face to correspond with the first. Then, changing the tools two or three times, the rough and finishing cuts are made over this surface. If desired to have grooves for belt clearance next to step, a round-nosed grooving tool must be used—of course first setting the lathe straight. Then all right and left side surfaces must be finished, changing either the tool or the work at least once for the two sides, and the edges of flanges nosed or rounded over. After all this manipulation the pulley is in about the same condition as that finished by the use of the forming tools as described.

But now about the time required for these several operations. The quantity of stock usually allowed for finish on pulley castings is not so great as to cause a great amount of strain on the lathe, even with very quick feed, but as the latter has, unavoidably, considerable effect on the smoothness of cut, it is necessary to avoid tool marks, which would be difficult to remove in finishing and polishing. Therefore a medium feed only is permissible. On the side surfaces the tool is set in for the proper depth of cut, and is then fed by the power cross feed, if there be one; if not, by hand. This is unavoidably a slow operation, and there are at least two, and frequently more, of these cuts to each surface. Then the roughing tool on faces is set to required depth of cut and the feed started. As the speed of rotation is necessarily slow on the larger diameters, even with the quickest feed allowable, it takes considerable time to run these cuts, to say nothing of that required in the various changes in manipulation.

Let us see what it will be for a cone pulley having length of combined faces of 16 inches—mean circumference of the several diameters 3 feet. At a periphery speed of 27 feet per minute, this would be

$$\frac{27}{3} = \text{a mean of nine revolutions. Say the pitch of feed is 16 per inch, then } \frac{16 \times 16}{9} = 28.44, \text{ say 28 minutes required}$$

to do the actual feeding for one cut only. For side turning by the new lathe the turret carries the tools. The latter are composed of the holders, made of the necessary shape to suit the shape of work, and the several cutters, of which there is one or more for each element of the composite outline. The cutters are preferably distributed on the face of holder so as to divide up the circle in a manner to equalize the strain at all points. Two or more of these tools are used for roughing and finishing cuts, all, of course, being carried consecutively by the different sides of turret head and indexed around as required. In turning it is only necessary to index the proper tool into position, and feed up to the work until the desired effect as to size, shape and finish is obtained. There is no setting for the cut as a preliminary to feeding; and herein lies the difference of method from that used in all other systems of turning metal—the element of "cut" is practically eliminated, and that

of "feed" only is essential. Neither is there any manipulation required in shaping the work, as this is arbitrarily fixed by the shape of the tools, as are also the several dimensions. The value of this feature is apparent as applied to work in which the duplication system is used. They must be accurate one with another, and, if the tool be right, all with the standard. As the tools are all made in the tool room, where accurate work is the rule, the absolute uniformity of all parts made by them becomes a matter entirely independent of the operator's skill, and is gauged only by that of the tool maker.

WORLD'S FAIR NOTES.

Arrangements for Exhibits.

Twelve thousand carloads of Columbian exhibits will probably be received at Jackson Park before May 1, 1893. This estimate of cars does not include what exhibits may be carted from down-town railway depots and from the shops and factories of Chicago firms. Such a vast freight tonnage presents one of the problems of the exposition. Its handling will be accomplished by method and the possibilities of confusion reduced to a minimum.

All shipments received by rail at the grounds must come necessarily over the Baltimore & Ohio and the Illinois Central railroads. Connections with the yards are made at Sixty-ninth street, and from these yards sidings radiate to nearly every building on the grounds.

By a universal rule freights on all shipments must be paid at the port of entry or at the point of billing exhibits. This leaves everything simplified at the receiving point at Jackson Park. When a shipment has been made the traffic department is notified by the shipper. Later, on arrival of the shipment, the carrier notifies the department and runs the goods down to the yards at Jackson Park. By the universal billing label the department to which each package is billed is readily shown. This car is then shoved as nearly as possible to the building in which its contents have floor space. All these cases and packages are taken charge of by department agents and placed on the assigned space in each building. Agents of the shippers attend the unpacking, after which packing cases, wrappers and such are again taken up by the traffic department and carted off to warehouses in the park annex on the south. Here they are stored until such time as their contents shall be repacked for shipment home. Each exhibitor is given a receipt for his cases, which shows to which warehouse they have been assigned. There are nine of these houses, each 117 x 300 feet in dimensions, and four smaller ones, occupying 15 acres of land near the grounds, leased for the purpose. The traffic department for each handling of cases or goods will charge at the rate of 6 cents per 100 pounds. Shipments in excess of 30,000 pounds will be charged for at a higher rate.

All foreign exhibits will be scrutinized and listed by the customs officers on arrival. Separate warehouses will be used for the storage of these cases.

In packing exhibits each package shall be consigned to a single department, and nothing not intended for that department shall be placed in it. Exhibits for the horticultural and agricultural buildings, for example, could not be put in the same case, no matter how small each of them might be.

For the receipt of single small packages and for the entrance of Chicago's exhibits to the grounds special arrangements will be made. Both have the privilege of shipment from down town by rail, but in most

instances it is conceded that drayage may be more convenient. To accommodate such receipt a general entrance will be set aside, through which express wagons will be allowed to enter. Directions will be given here, and exhibits may be unloaded without the services of the traffic department employees.

Cars that have so far been received by the department are:

Four cars of naval machinery.

Four cars of Japanese exhibits.

Four cars of taxidermists' exhibits for the Kansas Building.

Eleven cars of redwood to form tree trunk in Government building.

Congress of Inventors.

Inventors of all lands are promised an International Congress next year, which will discuss subjects of interest to them. President Bonney of the World's Congress Auxiliary has provided for the congress by appointing a special committee, of which Ephraim Banning, patent attorney of Chicago, is chairman and Lester L. Bond is vice-chairman, to make the arrangements. Benjamin Butterworth is a member of the committee, as is also P. C. Dyrenforth. This committee believes that there should be an international patent law to protect inventors. Chairman Banning says: "Of late years much has been said through the press and in legislative councils and elsewhere about international copyright law, but it will now be proper to consider whether in this respect inventors are not equally meritorious with authors and equally entitled to favorable consideration and protection. It is an appropriate question whether an international patent law protecting one form of intellectual property is not as necessary and applicable as an international copyright law protecting another form."

Other subjects for consideration will be trade-marks, treaty regulations in regard to patents, and uniformity of patent laws. The congress is to be held during the week commencing August 7, 1893. It is to be composed of men high in official positions in charge of the patent and industrial interests or departments of their respective governments; also lawyers, leading inventors, and manufacturers from all parts of the world.

Traveling Cranes Arrive.

Chief Robinson of the Machinery Department is rapidly pushing the interior equipment of Machinery Hall. Two or three large traveling cranes for use in this building are now on the ground. The one sent by Yale & Towne Company is erected in the center span of Machinery Hall and is all ready to start. The one furnished by the Morgan Engineering Company came in on cars recently, and is now being placed in position. The third, to be furnished by William Sellers & Co., of Philadelphia, is expected to be on the grounds within a week or ten days. These cranes operate on a track 1400 feet long. The cranes, each without a load, weigh 50 tons, and each will carry a load of 20 tons. They are operated by electricity.

A Great Pole from Washington.

The great fir stick, which came all the way from Puget Sound, was raised last Thursday in front of the Washington State Building. The pole raising took several hours, and cost over \$500, including the anchorage and a mile of rope.

As the fir stood in the forest near Everett, it ran to a height of over 300 feet. When the top was cut off there were 238 feet left, with diameters of 32 inches and 14 inches at the ends.

The curves of Rocky Mountain railroads did not permit the stick being brought intact, so it was cut in two at the middle. Even then four cars were required for each piece. Arrived at Jackson Park, a splice

of 14 feet was made, with steel bands holding the pieces together. A globe 15 inches in diameter was set at the top.

The standard for lifting the big stick, which weighed 31 tons, was 120 feet high, and supports ran to the ground some 300 feet to the westward. The ropes which were to lift the huge weight ran from the top of the standard to the stick and then back over pulleys to other pulleys and blocks until the power of the 20-horse engine was increased 18 fold. Once started the stick rose to its place without a hitch. Five guy ropes will support it until the anchorage has been completed.

Nothing along the avenues lined with State buildings is more striking than the great fir stick. It is the tallest thing on the grounds, and can be seen for many miles. Back of it is the house of fir logs which the State of Washington is building as its especial part of the show. Many of these logs are over 100 feet in length and as straight as a surveyor's line.

A Great California Redwood Tree.

Part of a great California redwood tree is now being erected in the Government building. The tree grew near Granger, Cal., and a 35 foot section of it, with a shell 2 feet in thickness, loaded 11 cars.

This tree was 23 feet in diameter at the base and was solid to the center. A transverse section of the stump, 2 feet thick, will serve for a base, around which sections of the tree 2 feet thick will be ranged in a hollow shaft with a door opening into it. This trunk will be erected under the dome of the Government Building. Each piece of timber has been boxed to avoid abrasions, and the natural bark surface will be shown in the trunk. These sections have been numbered to show the order of their positions, and a representative of the milling company making the exhibit is now on the road to Chicago for the purpose of setting it up. There are 46 of these sections, the 35 feet of trunk having been sawed into three lengths and afterward split up by sawing.

Progress on State Buildings.

Work on the State buildings goes steadily on, notwithstanding the season is far advanced and much disagreeable weather has prevailed for weeks past. With good weather for a couple of weeks and the arrival of building material needed, no fears need be entertained but that every State building now under way will be completed and ready for the opening day in May.

Work on the Illinois State Building is as far advanced as any other on the grounds. All that now remains to be done is the freecoining of the dome and the entrances.

Work on the South Dakota Building has been suspended until after the holidays. It is expected that a very liberal appropriation will be made by the Legislature when that body holds its January session. C. N. Cummings of Sioux Falls, who is in charge of the building, says that \$50,000 will be required to carry out the original plans for the structure and in beautifying the grounds and interior.

Owing to failure of certain kinds of building material to arrive, the work on the Wisconsin Building has been somewhat retarded. All the wood work can be finished in the next ten days, and perhaps in less time.

The Iowa State Building is now entirely completed, and was accepted by the Iowa State Board last week. The installing of exhibits will begin in a few days, the most attractive of which will be a miniature representation of the Capitol Building at Des Moines, which will be made of glass and filled with grains and native grasses grown in Iowa. The piece will be 17 feet in height, 22 feet long and 16 feet wide.

Ground for the foundations of the Idaho Building was broken last week. It will be built of native cedar logs resting on a brick foundation 7 feet high.

The Montana Building is finished and ready for exhibits. The installing of the latter will begin soon.

The building for Nebraska having been completed, is closed for a short time.

The Awards Committee.

The Awards Committee came to a conclusion last week, which was not acquiesced in by the Council of Administration. The committee decided in favor of judges and so reported, but the council have ignored the suggestion and are in favor of appointing jurymen. That is, three or more persons will pass upon exhibits of a certain class instead of one expert judge. The council are of the opinion that an expert is incompetent to pass fairly on an exhibit. He is regarded as being subject to prejudice. Three judges, it is thought, will be much better and insure a more just allotment of awards. Another amendment which will be made in the rules is that an exhibitor shall not have his display judged if such is his desire. This will be particularly the case with manufacturers of musical instruments.

It is also likely that every exhibitor will be furnished a copy of the findings of the judge or judges as soon as the report is transmitted to the examiners. This will give every exhibitor an opportunity to file his protest before the Committee on Appeals and insure to him a hearing in case he should be dissatisfied with the action of the judges. This provision will be entirely new. Heretofore exhibitors have been left to find out a long time after the award had been made that they were either favored or rejected.

It was decided by the committee to ask for \$570,000 from Congress, and out of the probable 680 jurymen to select but 250 from abroad.

The Opening Ceremonies.

President-elect Cleveland will be invited by the Exposition people to deliver the oration on the opening day of the World's Fair next May. Besides being the orator on the occasion the President will press the button and start the machinery going.

Oliver Wendell Holmes will be invited to write an original ode for the occasion and perhaps read it.

These two things were practically decided at a meeting of the joint Committee on Ceremonies last week.

These committeemen had something of a task before them in outlining opening ceremonies, for the Executive Committee has intimated that it has no further funds to lavish on ceremonial displays. Still this in no way interfered with the idea that Grover Cleveland should be the orator and Mr. Holmes the poet. Then the committee agreed that some prominent divine should be chosen for an opening prayer, and another for the benediction.

A musical programme will be rendered, and the details of it were left to Theodore Thomas and W. L. Tomlins of the Bureau of Music. This will entail no further cost, practically, in furnishing the music.

Director-General Davis will be given a place of conspicuous honor, and he will be called upon to present the department chiefs to the audience.

The ceremonies are to be held in the Choral Building, the contract for which was awarded last week. It will seat 7000 people, and this number will compose the limited audience who will hear the oration and the poem. It was found impracticable to accommodate a larger number, inasmuch as no other building on the grounds will then be available. The big Manufacturers Hall, in which the dedicatory ceremonies were held last October, will be filled with exhibits next May. The same

is true of all the other buildings, so that necessity must limit the audience.

The programme promises to be a brief one, not more than two hours long at the furthest.

The Souvenir Coins.

The first shipments of souvenir coins from the mint at Philadelphia were received in New York on the 16th and in Chicago on the 17th inst. The shipment to New York consisted of 10,000 coins bought by the *Mail and Express*, and that to Chicago of 50,000 pieces sent direct to the sub-Treasury for subsequent transfer to the World's Fair authorities. The mint began to turn them out on December 3 and over 500,000 have thus far been coined, but a great many preliminaries had to be satisfactorily arranged before any deliveries could be made.

Engines at the Fair.

Some 40 engines will be placed in Machinery Hall to furnish power for exhibitors. These engines, while performing actual service, will be exhibits also. They range from 150 to 2000 horse-power, and are so placed as to give a magnificent exhibit. The king of them all, an Allis quadruple-expansion, will stand directly at the end of the main aisle. Two belts six feet wide, one overlying the other, will drive two 1000-candle dynamos. The longer belt will travel over a mile a minute as it rushes around a flywheel 30 feet in diameter. It is not claimed that electrical engineers would ever run two dynamos in harness this way as a matter of business, but in the way of exhibits the experiments, doubtless, will be a striking one.

None of the engines will come up to the giant Corliss at Philadelphia, and the largest of them are excelled in manufacturing establishments. Most modern lake steamers have more horse power than the monarch of Machinery Hall, but then, when the Corliss engine astonished America the dynamo had not come to play its present part. For electrical reasons, so to speak, 150 horse-power engines are about the thing for arc lights, while the motive power at the Fair will show over 20,000 horse-power, but 3000 horse power will go directly on the shafts in Machinery Hall. The rest will travel on wires to the other buildings, there to be translated back in power or light by the arts of man. In a gallery of the Hall 216 wires on a switchboard will govern the power which runs the Exposition. Every building will also have a switchboard, which will regulate the distribution of light and power in its own particular domain.

For the exhibits in Machinery Hall power will be carried on shafting, and there will be over a mile of it in all. Outside of the pumps for fountains all the motive power of the fair will be confined to Machinery Hall with the exception of a few engines which form integral parts of exhibits in the Mining Building.

No agent of the Anti-Smoke Society need watch the stack of the boiler house, for only crude oil, piped from the oil fields of Ohio, will be used. The fuel is stored in 12 tanks, 8 feet in diameter and 25 feet long, sunk below the surface, for safety's sake, in the southeast corner of the grounds. The oil comes to the boiler house through a pipe 6 inches in diameter. In the evening, when both power and light are being used to the full capacity, one of the tanks will be emptied every hour.

The arrangement of the engines and dynamos has required all the skill of Chief Sargeant and his assistants. All the engines being donated for use as exhibits, position meant much to the builders, and while their wishes had to be respected, the demands of the public for a good show and the more intricate questions of a mechanical nature had also to be considered.

The engines had to be advertisements and displays and do the work at the same time.

The solution was in their arrangement into blocks, with wide aisles between. Three of these blocks are given up to the arc light machines, there being 100 of them. Then there are 12 big dynamos for incandescent lights and 20 power generators. By the Westinghouse electric contract that company is placing in position six of its own machines, driving 12 dynamos, in addition to the others.

The following is a list of engines and builders:

Builders and style.	Horse-power.
Buell cross compound.....	480
Armington & Sims simple.....	500
General Electrical triple expansion.....	500
Phoenix triple expansion.....	500
Phoenix tandem compound.....	250
Phoenix simple.....	250
E. P. Allis cross compound.....	500
Woodbury tandem compound.....	600
Woodbury tandem compound.....	375
A. L. Ide simple.....	250
A. L. Ide tandem compound.....	225
Ball & Wood cross compound.....	200
Ball & Wood simple.....	150
Ball & Wood tandem compound.....	150
Ball & Wood simple.....	150
Ball & Wood tandem compound.....	150
E. P. Allis quadruple expansion.....	2,000
Frazer & Chalmers triple expansion.....	1,000
McEwen tandem compound.....	220
Westinghouse-Church-Kerr compound.....	330
Westinghouse-Church-Kerr compound.....	330
Westinghouse-Church-Kerr compound.....	1,000
Buckeye triple expansion.....	1,000
Atlas compound.....	1,000
McIntosh Seymore double tandem compound.....	1,000
Westinghouse-Church-Kerr compound.....	1,000
Buckeye cross compound.....	300
Buckeye simple compound.....	125
Buckeye simple compound.....	125
Buckeye simple compound.....	190
Buckeye tandem compound.....	150
Russell double tandem compound.....	506
Russell double tandem compound.....	216
Lane & Bodley cross compound.....	300
Lane & Bodley tandem compound.....	300
Bass cross compound.....	224
Atlas tandem compound.....	500
Watertown double tandem compound.....	250
Skinner simple.....	150
Skinner simple.....	150

Features of the Canadian Exhibit.

Canada is preparing a surprise for American competitors in some lines of exhibition. The fisheries, agricultural and live stock contribution from the Dominion are to be significant, both in magnitude and quality. Another great display from across the border will come to Chief Skiff of the Mining Exhibits Department. Ontario has a great mineralogical display about ready for shipment. David Boyle has charge of it and has outlined its principal features. Some of the best specimens are gold ores of great value, some of the contributions by individual mines reaching half a ton in weight. The Belmont and Crescent mines are especially well represented. Nickel ore will be arrayed on a scale never before attempted. One specimen alone weighs seven tons, and one piece of matte nickel, after rough refining, weighs five tons. The Sudbury district, with one of the richest nickel deposits in the world, will have a special exhibit prepared by R. H. Alm.

Perhaps the most curious, because unusual, will be the magnificent specimens of mica. In the Ontario collection is a crystal, 18 x 20 inches and 9 inches thick, weighing 400 pounds. Another bit, a foot thick, weighs 120 pounds. Graphite is also to be shown from Perth, where, it is claimed, the largest deposit in the world is found. Marble, granite, phosphate of lime, talc, sulphate of baryta, asbestos, all are comprised in the collection. Lithographic stone of unusual value is also to be shown. The rarer specimens, exhibited in cases, include topaz, amethysts, garnets, agates and zircons. Altogether 2000 square feet in the Mines Building is set aside for the Ontario section of the Canadian exhibit.

TIN PLATE.—II.

General Arrangements of Tin-Plate Works.

Having described the manufacture of tin bar, we now turn our attention to its conversion into black plate and the process of tinning. In Figs. 14, 15, 16, 17 and 18

The tinning and pickling rooms are lofty, well lighted and ventilated, and wood instead of iron principals are used in the roofing (see Fig. 18) on account of the destructiveness of the acid fumes. Unless otherwise stated, all references in the following articles are made to this design.

While there are many large and wealthy tin-plate proprietors in South Wales, as a general rule the individual capital outlay

Tin Mills.—There are four mills, each couple driven by a separate pair of engines, with the auxiliary slow-motion gears, doubling and finishing shears, pair furnaces, &c. The mills are arranged in a line in such a way that two other mills

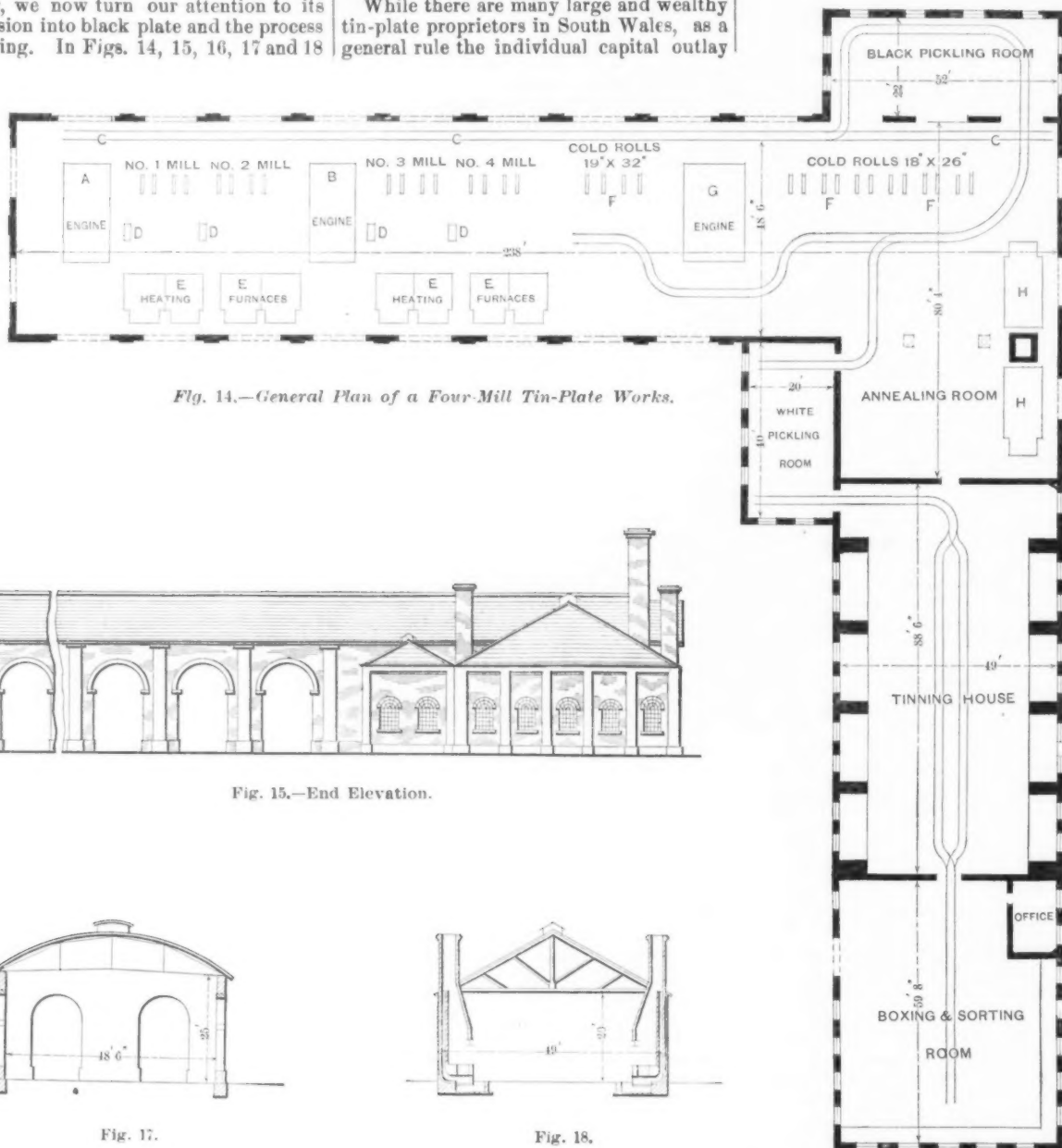


Fig. 14.—General Plan of a Four-Mill Tin-Plate Works.

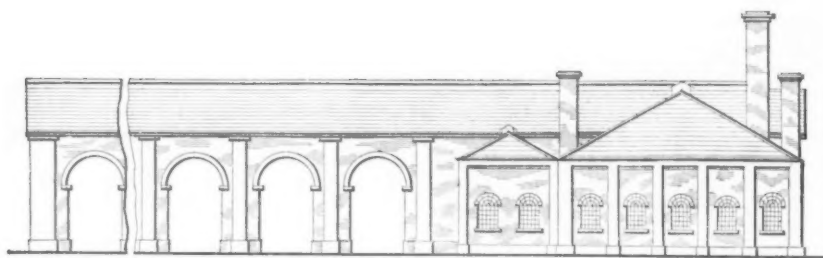


Fig. 15.—End Elevation.

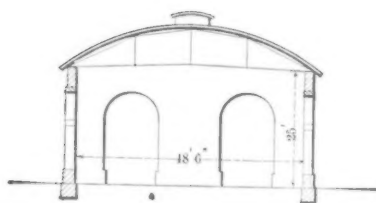


Fig. 17.

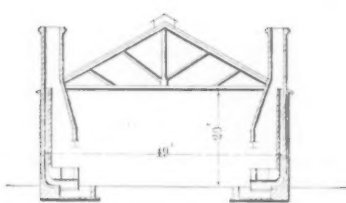


Fig. 18.



Fig. 16.—Front Elevation.

Figs. 14 to 18.—FOUR-MILL TIN-PLATE WORKS.

are shown the general plan and some elevations of a tin-plate works consisting of four tin mills, having a capacity of 2250 boxes of 112 pounds each per week, with cold rolls, tinning house, &c. The mills and cold rolls are inclosed in an open arched building, roofed with corrugated iron, 48 feet 6 inches span and 238 feet long. Outside this main building are the necessary railroad sidings for coal, &c., and a boiler house (not shown) in a convenient situation.

on plant is comparatively small, and this fact, taken in conjunction with the well-known conservatism of the trade, has undoubtedly obstructed large improvements that might be made. Some of these will be indicated in their place. At the same time, some of the more modern works are finely laid out and are in a position at a pinch, the price of coal and bars being moderate, to turn out at a profit a box of IC 14 x 20 weighing 112 pounds for \$2.52.

could be erected on the left of the engine A, Fig. 14, in which case No. 2 mill is to be coupled to engine B, and each will drive three mills. An engine of sufficient power could no doubt be erected to stand in the position of B and drive all four mills, but in case of accident it is much better to have a double source of power, and the larger engine would not be economical in the event of one side breaking down or stopping for orders. Coal is de-

livered to the heating furnaces by a convenient road at the back, and inside the building on the opposite side is a 22 or 24 inch gauge road, C, for conveying the sheets on trams to the opening benches or pickling rooms.

Tin Mill Engines.—The mills are driven by two pairs of twin compound condensing engines, as made for the tin-plate trade by Galloways, Limited, Manchester, with 26-inch high pressure and 46-inch low-pressure cylinders of 4-foot stroke. These engines run at 38 revolutions per minute, and indicate 400 horse-power, which is rather more than sufficient power to drive three tin mills. For condensing, these engines each use 250 gallons of water per minute, and the efficiency of two such engines as against three high-pressure condensing engines is as $2\frac{1}{2}$ to $3\frac{1}{2}$ each, expressed in pounds of coal per indicated horse-power, or a total efficiency

by 27 feet long. Two such engines and the cold-roll engine will require four steel boilers 28 feet long by 7 feet diameter working at 90 or 100 pounds pressure. In the event of the engine A being omitted, three boilers will be sufficient.

Mills.—Figs. 19 and 20 are views in plan and end elevation of a pair of tin mills, showing the slow motion gear and crank to doubling shears, roughing and finishing rolls of No. 1 mill connecting spindles with eccentric and rocking gear to doubling and finishing shears of No. 2 mill, and roughing and finishing of the second mill.

As the grain and chill rolls of a tin mill require constantly to be turned true and planished, that is to say at least once a week, a considerable saving of Sunday labor is made by putting "back gear" or slow motion to the leading spindle, by which means, on

rider is made of wrought iron or cast steel, and is kept down by an 8 inch hammered steel pin. In the finishing mill, on the other hand, it is found better to use two 5 inch instead of one 8-inch pin, as giving greater steadiness and therefore better finish to the sheets. The roughing is connected to the finishing by a spindle 30 inches long. The finishing rolls are chilled, but otherwise rolls and housings are similar to the roughing with the exception of the double pins and boxes over the rider. Between Nos. 1 and 2 mills is a hammered iron shaft, H, 11 feet long, upon which is fixed the rocking gear for working the doubler and finishing shears of the second mill.

The doubling shears D, Fig. 14, and I, Figs. 19 and 20, are of very simple construction, being a cast-iron knife lever rocking in guides on a self-contained standard, the lever carrying also a flat pro-

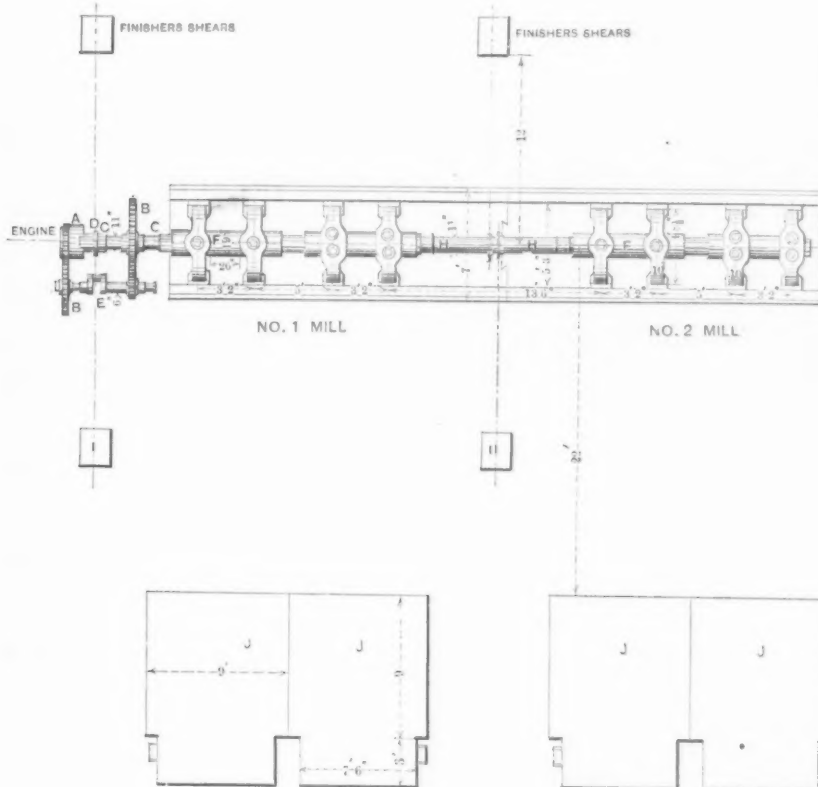


Fig. 19.—Plan.

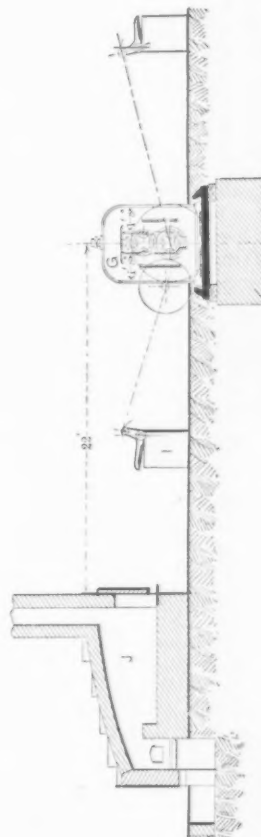


Fig. 20.—Elevation.

PLAN AND ELEVATION OF ONE PAIR OF TIN-PLATE MILLS.

in favor of the compound engines of 3 pounds of coal per indicated horse-power. There are three pairs of plain cast-iron slide valves, the first pair for admitting steam into the high-pressure cylinder (this has variable travel, regulating the admission of steam to the work to be done, without the intervention of a throttle valve, so as to allow the full boiler pressure upon the piston), the second pair regulating the passage of steam from the high to the low pressure cylinder, and the third pair passing the exhaust steam to the condenser. The connecting rods have 10-foot centers, and the crank shaft has two throws, the low-pressure throw being 195° in advance of the high-pressure. The air pump, hot well and condenser are fixed behind the low-pressure cylinder, and to guard against a breakdown through the intermittance of the load which is found in tin mills, causing water in the low-pressure cylinder, an ingenious condenser syphon is applied to break the vacuum when the water rises too high in the condenser. The engine framing is in three pieces, substantial and strong, and measures 9 feet 11 inches wide

running the engines slowly, the rolls can be touched up without removing them from the housings. The motion consists of a steel crab, A, Fig. 19, and two or three pairs of gear wheels, B, mounted on hammered iron shafts, and the whole resting in pedestals suitably bolted down to the bed plate. The main spindle C, which may also be of cast steel, carries an eccentric, D, to give motion to the rocking arm of the finishing shears, while the countershaft E has a throw crank giving the same motion to the doubling shears. These shears will be described presently. The leading spindle is connected with the end of the bottom roughing roll F by a 13-inch by $8\frac{1}{4}$ inch wobbler. The roughing rolls are hard-grain castings, composed of a mixture of 784 pounds of Bessemer "hard 4" and 330 pounds of mottled. Should the "hard 4" be rather too rich half a pig of white iron is added. The dimensions are given in the figure. The rolls are mounted in rather heavy (about 5 tons 10 cwt.) housings G, the brass chocks being disposed as shown in the end view, Fig. 20. The

section which beats upon the doubling table attached to the standard. The doubler is worked by a long link from a crank on the slow-motion gear and should be within reasonable reach of the furnaces. On the opposite side of the mill train are the finishing shears, one to each mill, of similar construction, but provided with gauges instead of the doubling table. The Welsh rollers like to have their own output sheared on the spot, but it would be more orderly to remove the sheets right away on the small-gauge trollies to a separate department for shearing and splitting. Here the shears could be driven in a line from shafting, and the floor space in the mill kept clear of sheets and shearings. By this method, too, at least one extra handling could be saved.

The heating, rolling and doubling of sheets until they have attained the correct length and gauge are well understood and a detailed description is unnecessary. The ordinary pair furnace E, Fig. 14 and J, Figs. 19 and 20, as used in Wales, is found also in the States. It has a wide door, toward which the flame travels from

the grate in the back, and the stack is over the front of the furnace. Each pair costs to erect about \$312 and the wages of this and other departments will be found later. Assuming that the steel or iron is good in quality, it is in the heating that the greatest care is necessary and in which the most faults are incurred.

Among these faults by overheating is that of the doubled sheets sticking to each other so tightly that they cannot be separated without making wasters of them. Otherwise the separation is easy and this work is chiefly done by girls, who, provided with a leather palm piece having pieces of lead riveted on, which fits on the hand and thumb, are able to open 40 boxes each per day of ten hours. The lead catches the edge or corner of the sheets better than any other instrument yet found. "Stickers" are put aside to be opened by men.

The shearings take up a great deal of room and accumulate very fast, so they should be collected and bundled continuously. They are considered of great value in the open-hearth furnace on account of the rapidity with which they melt, and there is always a strong demand for them at about \$10.80 per ton. In the furnace they should be sunk immediately with the rabble into the initial pig bath, in order to be exposed to oxidation for as short a time as possible, about 25 per cent. of the total charge being the usual proportion. There are several devices for bundling and pressing them into a more solid mass, giving less surface open to the rapid oxidation in melting, but into these we need not enter.

Black Pickling.—The black plates are plunged in hydrochloric acid or muriatic and sulphuric acids, with the object of removing the oxide from the surface. The latter acid sometimes contains a considerable proportion of arsenic, which should be avoided. As a considerable quantity of plates has to be treated, it is necessary

black patches, the cradle is raised, pushed over the water bosh, into which it is lowered simultaneously with a new cradle load into the acid, both receiving again the same vertical motion. While these two cradles are treated, the contents of the one being pickled and of the other washed in fresh water, a number of girls under the superintendent are engaged in emptying the cradles of sheets already pickled, and filling another ready for that operation. The machine will be better understood on reference to the diagram, Fig. 21, showing two cradles in position over the boshes, and three others in position for discharging or loading.

Another machine (Grey's) is similar in idea, consisting of a vertical cylinder fixed in the center of a cast-iron pillar having swinging radial arms, each carrying a

short steam coil in order to heat the contents and hasten the action. Such machines as described pickle from 10 to 12 boxes at a time, the labor being one man in charge at 72 cents, three girls discharging cradles and two assorting sheets at 32 cents each, day wages. In the cost sheet to be given, it is shown that 9½ pounds of acid is used per box pickled, but over the period given this works out excessive, and the quantity should not be more than 7½ pounds per box at the outside. The above labor can easily treat the output of four mills.

An economical and valuable addition to some tin works is found in a small plant for the production of sulphuric acid. Three iron retorts for heating commercial sulphur, two large timber fume condensers lined with sheet lead and a purifying ap-

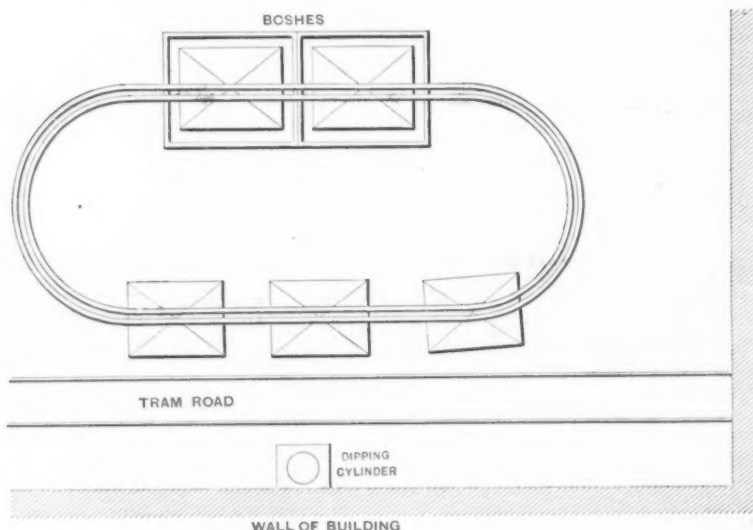
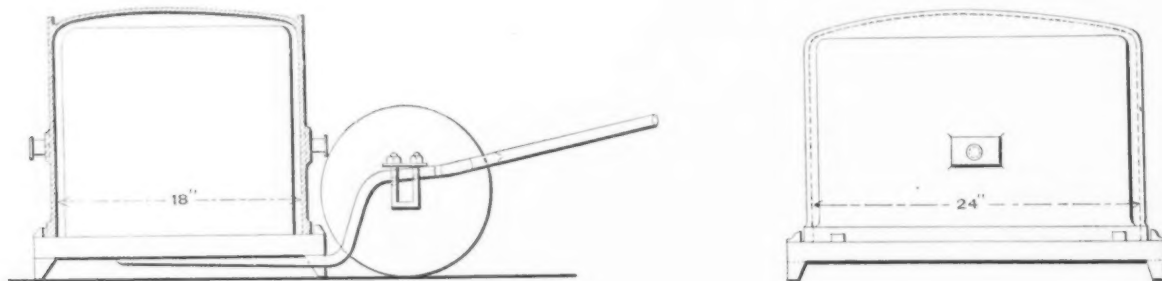


Fig. 21.—Diagram of Five-Cradle Pickling Machine.



Figs. 22 and 23.—Cast-Steel Annealing Pot.

to have an efficient machine, which should be to a large extent automatic and continuous in action. There are several such in existence. One of these has four or five yellow-metal cages or cradles suspended from an overhead timber framing, so as to travel on angle irons or rails in an oval path. The continuity of these rails is broken above a pair of wood boshes, one lined with lead and containing the vitrol, and the other containing clear running water. When the first cradle, loaded with sheets set on edge between the fingers or combs, has been pushed immediately over the pickle bosh, it is lowered by a 12 or 14 inch vertical steam cylinder into the acid, and by means of a tappet and lever to the steam valve an automatic vertical motion of about 12 inches is set up, and continued until the valve is opened by the attendant. The weight of the cradles is, of course, balanced by wire ropes or chains passing over sheaves to balance weights. Having thus been kept in motion for a period depending upon the extent to which the acid has been diluted, until all the sheets show a clear silvery face without

cradle. In this case, therefore, the cradles travel in a circle. Still another (Whitehouse's) is modeled on the same lines, the only difference over the first described being that the cradles have wheels traveling on an oval track laid on the floor level and engaging with the cylinder motion in passing over the respective boshes. The patentee of this machine justly prides himself upon the quality of his plates, and to insure proper pickling he is in the habit of inserting a ¼-inch copper rod between the sheets so as to separate them and give free access not only to the acid, but to the water in the subsequent swilling. There are other machines giving a swinging instead of a dipping motion.

Even with the proper motion there is a proportion of the sheets that have been in such close contact that black patches show, and it is therefore necessary to look them over before being forwarded to the next department. The boshes are composed of 3-inch deal planks tongued and braced together, 6 feet by 4 feet 9 inches and 3 feet 9 inches deep, lined with lead. The acid bosh is occasionally found to be supplied with a

paratus are all that is required, and the outlay, with the exception of that in sheet lead, is small. The sulphur comes from the Sicilian market.

The pickled plates are removed on the small-gauge track to the annealing department. Were it not for the large outlay in brass cradles (which weigh 200 pounds each) that would be required, they might be removed bodily to the annealers and so save the labor in loading and unloading the trolleys.

Annealing.—The annealing furnace HH, Fig. 14, is simply a long reverberatory furnace, the hearth of which is level with the mill floor, and the door is wide. The plates are packed, while still wet, upon the base plate of the annealing pot, a sketch of which, in cast steel, is shown in Figs. 22 and 23. One of these views shows the trolley for transferring the pots from or to the furnace. The moisture and the heat combined are necessarily very trying, and a great deal of attention has been paid to the design of the pot. The most generally adopted form is made of ¼-inch wrought-iron plates, with outside

angle irons, the advantage being that the warping which takes place can be cured by the sledge hammer. For first annealing it is found that cast iron cracks badly. But a well-designed cast-steel pot, having bellied sides and strengthening beads, though it has not so long a life as the wrought-iron one, can be cast so thin as to be superior in economy, and will last some 12 months, the cost coming to about 2 cents per box of sheets produced.

The plates should be packed close, with a couple of wasters on top, and the pot clamped over them, after strewing a little scale from the furnace around the edge of the base plate or stool in order to make the contents air tight. A little scale thrown over the top of the pots protects them from the direct flame and adds a little to their length of life. The furnace is then closed and fired slowly and with extreme care for eight to ten hours, the coal used in this, together with the second annealing, being from 450 to 500 pounds per ton of produce, and the labor cost 41 cents per ton.

This method of annealing, though general, is palpably uneconomical, and there are only a few concerns that fire with gas and regenerate the air. A furnace having these improvements as in use in a prominent sheet works is shown in Figs. 24 (side elevation) and 25 (sectional plan), in which the floor of the lower part of the furnace is the top of a removable bogie, B, carrying the pots P, and the upper part is a similar platform, A, traveling on cast iron balls. The joints J J are made tight with sand, and the large doors must also be carefully closed to the air. The arrows will show that continuous regeneration of the air between the flame-flues is taking place, and it appears that the economy in fuel is considerable.

Attempts have been made from time to time to introduce a close annealing furnace having an inner brick work shell surrounded by the flame flues, so that the sheets are not subject to the direct flame and may be packed in the furnace without using the costly annealing pots, but no success has attended these efforts so far. Nevertheless, this idea is well worthy of consideration.

Cold Rolling.—In the general design, Figs. 14 *et seq.*, are shown eight pairs of cold rolls, F, two of which, on the left of the engine, are for the larger sizes of sheets, and six pairs on the right side of the engine are for the common size, 14 x 20. These rolls are 19 and 18 inches diameter respectively, with smaller necks (say 10½ inches) than are required in the hot mill, and housed in lighter standards. They are chilled to a greater depth, generally 1 to 1½ inches deep, and are provided with the proper slow motion next to the engine. The speed may be the same as in the mills, namely, 38 to 40 revolutions per minute. The engine G may be of the same type as those driving the tin mills, but to save space it is more usual to find that two parallel trains about 16 to 18 feet apart are driven by gearing from the two sides of a main driving wheel on the engine crank shaft. If so, the rims of these wheels should have helical teeth cast in steel, as these give the requisite smoothness of motion and strength. The best proportions are: Driving wheel, 5 feet 9 inches diameter by 4½-inch pitch by 9 inches wide inside shrouding; spurs, 8 feet 6 inches diameter; fly wheel on crank-shaft, 16 feet diameter and 18 tons weight, driven by a compound tandem condensing engine 16 inches high pressure by 30 inches low pressure by 3 feet 6 inches stroke, with condenser at back of low-pressure cylinder.

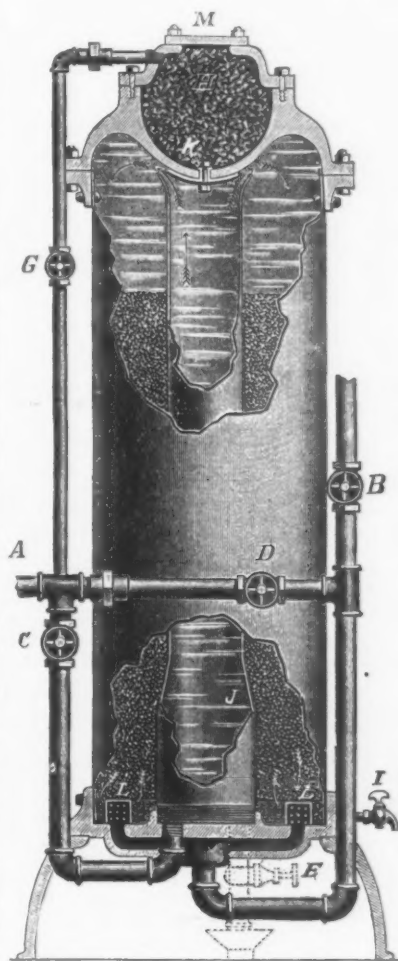
After the process of annealing the plates are very soft and in the right condition to be easily planished. The rolls, which are kept in condition by the use of emery and oil, must be true and smooth, for if the

plates buckle or show streaks no good tin plate can be turned out. They are passed through the rolls at least three times for the best plates, and as this necessarily compresses and hardens the sheets, they have to be returned to the annealing furnace again.

The cold rolling is done entirely by boys, who sit in front of the rolls and pass the sheets singly and rapidly through on to a bench on the other side, from which they are carried by other boys to a convenient position for the annealers. The boys generally work in the day time only and one pair of rolls should planish about 65 boxes in the ten hours at a total labor cost of 40 cents per ton, or in some establishments a little more. The boys are paid from 36 to 48 cents per day.

Carter's Improved Filter.

The accompanying engraving is a perspective view, with parts broken away to show the interior, of a filter built by the



Carter's Improved Filter.

Field Force Pump Company of Lockport, N. Y. The water is admitted through the main pipe A, passes downward through the pipe C and enters the filter at the bottom of the central cylinder J. It passes upward through this cylinder to the bottom of the coagulant chamber H, where, by means of a corrugated cup at K, it receives (when necessary to use it) a small amount of the coagulant which precipitates the impurities held in solution and which are gathered together in solids and are arrested by the sand and thrown out when the filter is cleansed. After leaving the cylinder J the water is turned downward with an equal pressure upon all parts of the filter bed, and passes downward through the strainers L L into the pipe B. When the filter bed becomes foul and dirty

from the matter taken from the water the cocks C and B are closed and the cocks E and D opened. The water then passes up through the strainers L, outside of the central cylinder, through the bed of filtering material, carrying with it in its upward flow all impurities that have been arrested by the sand, discharges it into the central cylinder and into the water pipe through the cock E, which is never opened except when the filter is being cleaned.

A communication from John D. Walsh, superintendent of the American District Steam Company of Lockport, N. Y., whose business is house heating from a central plant and who have 6 miles of underground steam pipes heating in a radius of 1½ miles, states that they use from 4900 to 5600 tons of coal a season and of course a large quantity of water, which is said to be "the worst water in the State." They have two Carter filters of 25,000 gallons capacity in 24 hours. Both filters are washed every 24 hours and they take out everything but lime. After the water has passed the filters it is let into a tank and treated with a small quantity of soda ash to remove the lime. The boilers show no trace of scale after runs of three weeks.

British Naval Speed Rules.

A regulation issued recently by the British Admiralty defines specifically the technical meaning of certain terms employed to indicate the speed to be used by the naval vessels of Great Britain under different conditions of service, and gives rules for determining the power at which the engines are to be worked in conformity with these technical speed terms.

The standard established under this regulation for any vessel is the full power authorized for such vessel during a brief period of the time devoted to her quarterly high-speed trials under service conditions and with natural draft. This standard is taken as unity and the power prescribed to be used at any other time is referred to it.

The classification adopted is as follows:

(a) The authorized power with natural draft is taken as the standard, or the unit. This power is to be used only during four hours of the quarterly passage trials of vessels, or in an emergency, and the air pressures to be used for the attainment of this power are not to exceed, in the fire rooms, ½ inch of water for cylindrical boilers, and 1 inch of water for the locomotive boilers of torpedo gunboats, except when the boilers are fitted with automatic ash-pit doors, in which case these air pressures may be exceeded by ½ inch of water if necessary to obtain the authorized power.

(b) "With all dispatch" means the maximum power that can be maintained for 24 hours, and is to be considered as being ¾ of the standard (a). The ¾ power is only to be employed in cases of great urgency.

(c) "With dispatch" indicates the maximum continuous sea-going speed—that is, the highest speed which can be kept up constantly for days or as long as the coal lasts. The power prescribed for this speed is ¾ of the standard. When steaming "with dispatch" all the boilers are supposed to be in use, with the engine-room force doing duty in three watches, assistance being given from deck if necessary owing to the coal being so stowed as not to be readily accessible.

(d) "With moderate dispatch" is to be understood as meaning that ¾ the standard power (a) is to be used.

(e) "Ordinary speed" is the term employed when ½ the standard power is to be used, and covers the conditions under which passages are to be made ordinarily.

(f) "Most economical speed" denotes the speed at which the greatest distance can be covered with a given amount of coal. This can only be determined by trial for each ship, under varying conditions of wind and weather. This speed is to be adopted whenever the economical use of fuel is imperative and also in those cases where the "ordinary speed" is less than the "most economical speed."

The quarterly passage trial, to which reference has been made, is a trial executed once a quarter, except in the case of vessels engaged on surveying service. The object is to make sure that the machinery is kept in efficient order and to provide for the training of the engine room force in working the engines at high speed. The trial consists of a passage of not less than 24 hours' duration, made "with dispatch." During each one of these trials the engines are run for a period of four hours at their highest speed with natural draft, care being taken not to exceed the authorized natural draft power.

The use of the steam blast during the quarterly passage trials is prohibited and vessels fitted for using it are only allowed to resort to this means of increasing their speed in cases of great urgency and for short periods only.

The Worthington Feed-Water Heater.

The new Worthington feed-water heater is especially applicable to compound and triple-expansion engines, in which partially spent steam is used, being drawn preferably from the intermediate receiver, and to simple non-conducting engines in which the exhaust steam is used. The water to be heated is fed from the tank B to the heater A by the supply pump C, having the suction pipe D and force pipe E, and from which the heated feed water is fed to the boiler by the delivery pump F, having the suction pipe G, connected to the bottom of the heater, and the force pipe H. The steam for heating the water enters the heater through the pipe I and valve chest K, Fig. 2, and steam is supplied to the pumps through the pipe L, valve chest M and the pipes N O. The supply of steam to the pump C is controlled by a float 11, within the tank B, operating in the usual manner so that as the water in the tank falls below a certain point the supply of steam is cut off. In engines employing a condenser and hot well, the supply tank is the hot well, which is fed through the pipe P from the condenser in the usual way.

The water from the tank is delivered through the pipe E to a pipe, Q, entering the side of the heater and extending upward so as to deliver the water in the upper part of the heater. The water is delivered from the pipe in a fine spray, the spraying apparatus being formed as follows: Inside the upper end of the pipe Q, Fig. 2, is mounted a sleeve of brass, 12, and a plate, 13, of similar metal, forming a valve, is mounted to slide within this sleeve by ribs, 14, this plate and sleeve engaging by inclined surfaces, 1, so as to form a spray between the plate and sleeve. The plate is also provided with wings, 15, projecting outwardly from the inclined surfaces 1 in all directions, and provided with curved surfaces, 2, between and upon the wings, the curves of these surfaces being so formed that the water passing between the inclined surfaces 1 is thrown outward and downward in all directions to form a fine spray. The valve 13 is spring-pressed by a coiled spring, 16, resting on it and held under tension by a cap, 17, carried by a bar extending through the head of the heater and screw-threaded so as to be adjustable by the hand-wheel outside the heater.

The heater is provided at the top with a small pipe, controlled by a throttle

and forming an air escape, which may be connected to the condenser or air pump or open to the atmosphere if the pressure in

lar plate, 20, forming a chamber extending about the heater, the steam thus being divided up finely by the perforations in the

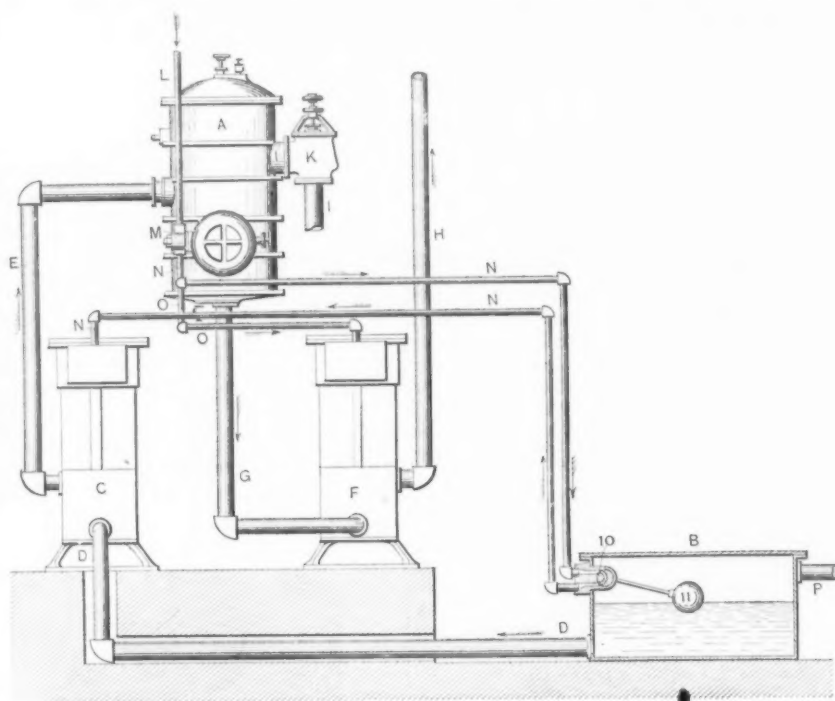


Fig. 1.—Side Elevation.

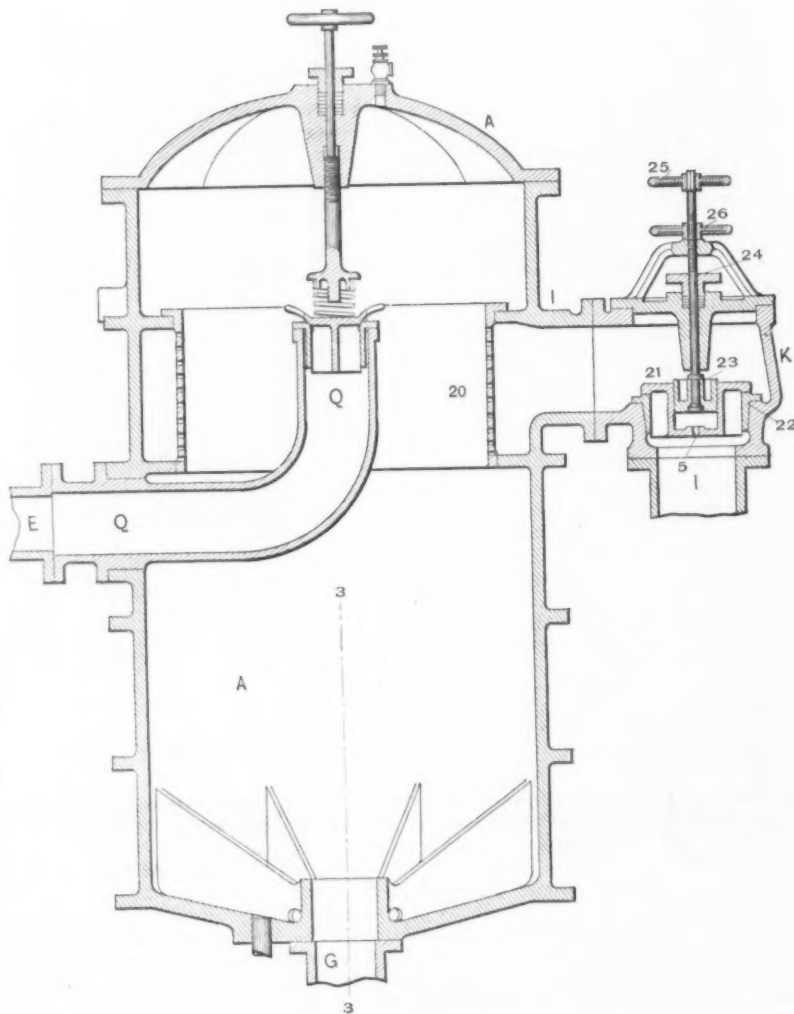


Fig. 2.—Central Vertical Section of Heater.

THE WORTHINGTON FEED-WATER HEATER.

the heater be sufficient. The steam from pipe I enters the heater opposite the spraying apparatus through a perforated circular plate. It will be seen that by this construction of heater and arrangement of water and steam admission a perfect mix-

ing of the fine particles of steam and water is produced, and all the heat of the steam utilized by the meeting of the water and steam directly as the steam enters the heater. It will be seen, also, that the spraying apparatus and all the operating

ring, 22, in the valve chamber K and opening inward, so as to form a check valve to prevent the return of water through the valve in case the pressure inside the heater should exceed that in the pipe I, a dash pot to prevent concussion being formed

screw-threaded, so as to be adjusted by a hand wheel, 25, outside the valve chest and secured in position by a set nut, 26. By this construction, also, the heater may be cut out when desired by forcing the plug 23 home on the valve 21 and securing the

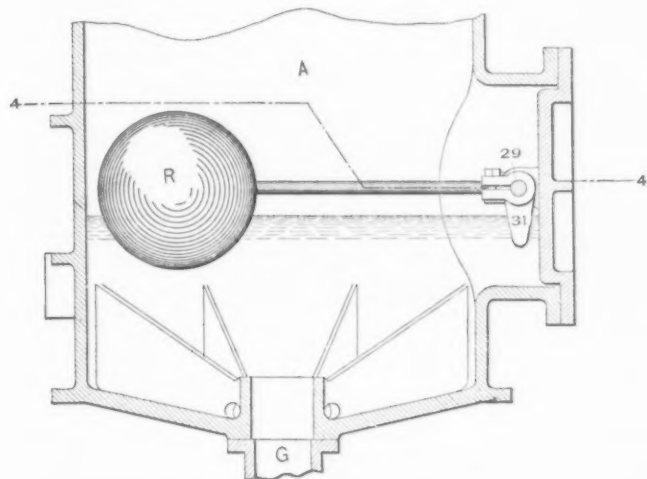


Fig. 3.—Steam-Controlling Valve.

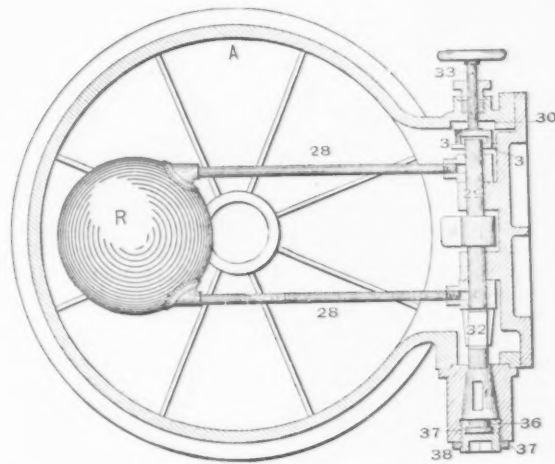


Fig. 4.—Section on Line 4 4 of Fig. 3.

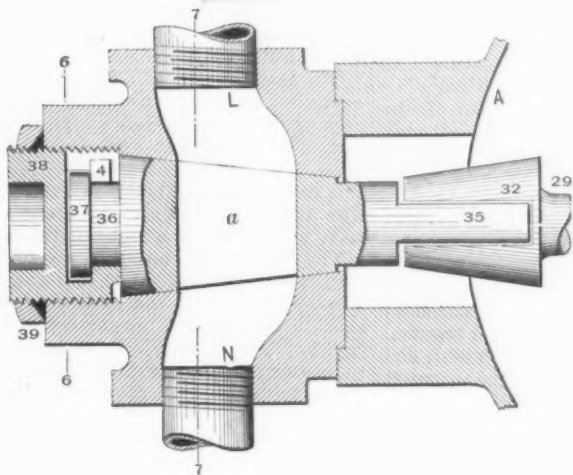


Fig. 5.—Valve Chest.

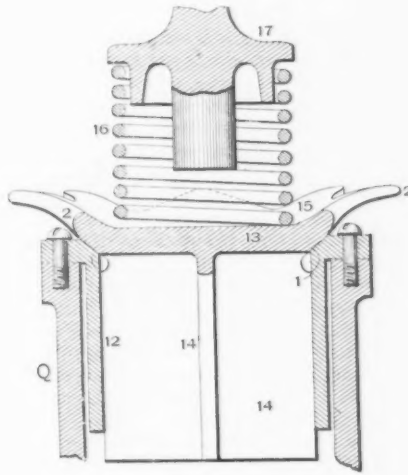
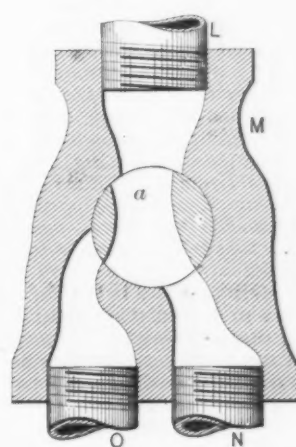
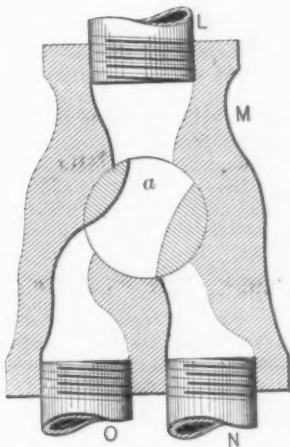
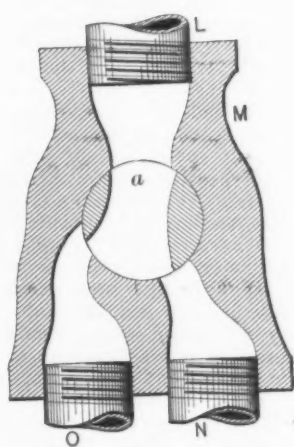


Fig. 9.—Spraying Apparatus.



Figs. 6, 7 and 8.—The Valve in Different Positions.

THE WORTHINGTON FEED-WATER HEATER.

parts within the heater are readily accessible by removing the head of the heater and without interfering with the water or steam connections.

The valve admitting the steam through the pipe I to the chamber consists of the valve proper 21, seated upon a hard metal

by a small opening, 5, in the base of the valve connecting with a chamber in which is a plug, 23, upon which the valve 21 slides, this plug being adjustable, so as to regulate the dash pot by the rod 24, connected to the plug and extending through the head of the valve chest, in which it is

rod 24 so as to hold the valve closed. For the purpose of controlling the supply of steam for the pumps in accordance with the amount of water in the heater, the following construction is provided: The arms 28, Figs. 3 and 4, carrying the float R within the heater, are secured to a

rod, 29, mounted in a casing, 30, formed on the side of the heater, this rod being provided with an arm, 31, which engages the inner side of the casing so as to hold the float from striking the bottom of the heater, and with a fork, 32, by which the valve stem is engaged. This rod, 29, is provided at one end with a cross pin, 3, which is engaged by a forked rod, 33, extending outside the casing and provided with a hand wheel so that the shaft may be turned by hand to start the valve in case the float fails to operate it. This rod 33 may be withdrawn, so as not to engage the pin, thus relieving the shaft 29 from the friction of the rod, so that it may be operated easily by the float.

The valve chest M, Figs. 5 to 8, is provided with a single port for the supply pipe L, and with double ports for the pipes N O, through which, respectively, steam is supplied to the supply and delivery pumps, these ports being controlled by the single valve *a*. This valve is provided with a stem, 35, adapted to be engaged by the fork 32 for turning the valve, and is of conical form, so as to enable a close joint within the valve chest to be formed by forcing in the valve. The head of the valve is provided with a reduced neck, 36, and cap, 37, by which the valve may readily be introduced into and removed from a screw plug, 38, which is cut away on one side to form a recess for the cap and shoulders, 4, engaging the cap as the plug is withdrawn. By this construction the valve is moved inward and outward with the screw plug so that it may readily be adjusted by the screw plug or withdrawn from the valve chest, while at the same time the valve is not rotated by the rotation of the screw plug. The blade and fork connection of the rod 29 and valve stem 32 also permits the valve and valve chest to be removed without interfering with the float construction, and *vice versa*. The plug is held in position when adjusted by a set-nut 39, preferably packed for greater security, as shown.

The valve *a* is so positioned relatively to the ports connecting with the pipes N O that in the normal position of the float R, as shown in Fig. 3, with a sufficient supply of water in the heater, the valve is held in the position shown in Fig. 6 with the steam passing from supply L to both of the pipes N O, the steam through pipe N passing through the valve 10 on the hot well B to the pump C and both pumps being in operation, the pump C supplying water to the heater through the pipe E and the pump F delivering heated feed water to the boiler through the pipe H. If, however, the feed water in the heater rises above a certain amount, the valve is turned by the rising of the float R into the position shown in Fig. 7, in which the supply of steam to the pump C through pipe N is cut off, thus stopping the supply of water to the heater. If the water in the heater falls below a certain point, the valve is turned by the falling of the float into the position shown in Fig. 8, in which it operates to cut off the steam from the pump F, thus stopping the delivery of water from the heater until the float has been raised again by the delivery of water from the hot well by pump C. The valves and ports are preferably so arranged that as the float moves the valve from its central or normal position in either direction and begins to cut off the supply of steam to one of the engines it opens the other port to increase the supply to the other engine, so that the proper balance of power in both engines is preserved and the proper delivery of water to and from the heater secured by the rise and fall of water in the heater. It will be understood, also, that the supply of steam to the pump C is controlled by the valve 10 and float 11 in the hot well, so as to secure the shutting off of the steam from this pump when the water in the hot well falls below a certain point,

the supply to this pump thus being controlled by both the heater and hot well, so that the pump is stopped when the supply of water in the heater is too great or that in the hot well too small.

This heater is the invention of C. C. Worthington of Irvington, N. Y.

The Armour Institute.

The great meat packer, Philip D. Armour of Chicago, long known for his practical philanthropy, has just made public the details of a most munificent gift to the cause of education in that city. He has endowed with property worth over \$1,500,000 a manual training school, to be known as the Armour Institute. The building, palatial in its adornment, five stories in height, has been under construction for some time, and is now about finished, but its purpose was until the past week absolutely unknown to the public. It is located on Thirty-third street, near Armour avenue. Following is a description of the building:

The Armour Institute, aside from the size, the beauty of its design and the costliness of its fittings, is of unusual interest because of the exceptional care with which the design of each part has been adapted to its special use. Mr. Armour had for his architects Messrs. Patton & Fisher.

The building, which is 175 x 65 feet, with the entrance in the middle of the long side, is divided by heavy fire walls into three portions of nearly equal size. The north pavilion and the front part of the middle are devoted to the literary and scientific departments. The south pavilion is to be used for manual training. The workshops in this building are finished to look like workshops, except that, as compared with an ordinary workshop, they are like the parlor of a palace compared to that of a cottage. South of the main building and adjoining it is a one-story wing containing the boilers and engines. This portion is absolutely fire proof, and will be, without question, the handsomest and most costly engine room in Chicago. There will be two large Corliss engines, one to run the machinery and the other to run the electric light plant of the building. There will be dynamos in the rear part of the engine room of sufficient capacity to furnish the 1500 lights for this building, and also to supply the other buildings if desired. It will be a part of the course of instruction to teach the students the practical operation of steam engines, pumps and electrical appliances, and for this reason all such machinery will be placed where it will be open to inspection. An alcove 12 x 25 feet in size, opening from the engine room, will contain all the pumps and tanks for the steam heating and power, which, as well as the engines, will be visible from the street through the large plate glass windows. The floor of the engine room is on a level with the basement, and a doorway admits directly into the blacksmith shop, 36 x 54 feet. This will be filled with forges and other appliances for working metal. Back of the blacksmith shop is the ventilating apparatus.

At the right and left of the main entrance are the reception room and superintendent's office. To the right is the great library, 54 x 60 feet, 15 feet in height, magnificently lighted on three sides. The bookcases, which are not yet in place, will furnish shelves for 25,000 volumes, and yet have one-half of the area available for readers. Retracing and passing to the southern end of the hall is the entrance to the machineshop, which is the same size as the library. The floor of this room is of hard maple. The walls are faced with white enameled brick and the ceiling is of Georgia pine, the timbers being exposed and varnished. On the second floor, over the machinery shop, is a room the same

size for wood-working machinery. On the other portions of this floor are the mechanical and physical laboratories, with lecture and class rooms. On the third floor at the south end is a hand workshop similar to the wood-working shop. In the center of the building on the east front are two classrooms. The whole of the north pavilion on this floor is devoted to mechanical drawing. There are lavatories on the first, second and third floors, and also special toilet rooms for the use of the instructors.

The whole of the fourth floor will be devoted to the girls' department. It is divided in similar manner to the floors below, the south end being devoted to manual employments, such as cooking and dressmaking. The other portion of the floor is divided into recitation, lecture, drawing rooms, &c. It is intended that the girls shall be carried up to this floor by the elevator, and, as all their working rooms and classrooms are on this floor and toilet rooms provided on the same level, there will be no climbing of stairs for them.

The whole of the south pavilion on the fifth floor will be devoted to a gymnasium, which is to be fitted up with the most approved apparatus. The north pavilion on the fifth floor is arranged so that it can be used either as a drill hall or a museum. The most extraordinary precautions have been taken to prevent the noise from the gymnasium and drill hall from being heard in the stories below.

The exterior of the building is Romanesque in style and from the size and dignity of its design has an imposing effect. The basement and first story are built of brown sandstone, the upper portion of red pressed brick and terra cotta. The whole is crowned by a steep slate roof, which rises to a height of 126 feet.

The cost of the building, exclusive of furniture, is over \$200,000. The building is completed, with the exception of putting in the engines, machinery and furniture. The engines have already been purchased and the architects have received orders to design bookcases and other interior fittings.

The school will have such relations to the public schools and to the university as will amply fit it for the preparation of students for the latter, especially in the scientific branches. The idea is to establish an institution for the education of head, hand and heart. Mr. Armour's idea in manual training is that it shall be taught and done so that the muscles shall not be more thoroughly trained than the moral character and the perception of truth and beauty. The student in Chicago's great manual training school, in the possession of which it will so soon come, will be given the comprehensive basis of a liberal culture. His teachers will form a faculty of the highest standing obtainable in this country. The library will be completely supplied with books bearing not only on the English language and literature and the more polite fields of learning, but also on the theory in practice of the steam engine and those things which are supposed to be more in the line of a manual training school. It is expected that the school will open on September 1 next. During the next few months the most complete apparatus obtainable for every branch will be secured.

Disbursements not to exceed \$15,000,000 will be made by the New York, New Haven & Hartford Railroad Company for the completion of four tracks on the New York division, including the Harlem River branch; for the completion of two tracks between New Haven and New London; for terminals, notably at Providence, New London, New Haven, Bridgeport and New York, and for additions to the company's motive power and equipment.

The Ulrich Oscillating Steam Engine.

M. Ulrich of Holyoke, Mass., builds a double-acting engine, the cylinder being pivoted at the middle of its length upon

alternately register with live steam and exhaust ports in a stationary steam chest. The engaging surfaces in which the port openings are formed are substantially cylindrical and co-axial with the axis of oscillation of the cylinder. The steam

accompanies the cylinder is placed first in connection with one and then with the other as the cylinder oscillates.

The steam passages leading to the cylinder are clearly shown in the vertical section, Fig. 2. To the inner side of the cylinder is bolted a valve piece formed with a cylindrical portion concentric with the trunnions. Passages in this valve piece constitute extensions to the steam passages in the cylinder heads. The bottom of the valve piece, in that part next to the cylinder, is formed with a depression to receive the adjacent trunnion and its bearing. Referring to Fig. 2, the steam chest is shown at the right, securely fastened upon a bracket connected with the main framework. This steam chest is in the form of a cylinder having inner and outer walls connected at their ends so as to inclose a space between them, the outer cylindrical wall having a working fit in the valve piece, while the inner wall and one head or end are shaped to fit over the projection that incloses the main cylinder trunnion. The steam chest is formed with bosses to which the steam and exhaust pipes are connected. The space inclosed in the steam chest is divided by a partition into two separate chambers connected with the steam passages. The plane of section on which Fig. 2 is drawn lies in this partition, and the shape of the chamber at the farther side of the partition is indicated by the dotted lines. Suitable port openings are formed in the outer cylindrical wall of the chest close to the partition, as shown in Fig. 3, so that the ports in the valve piece during oscillation of the cylinder are brought alternately into connection with the steam chest ports. The advantages claimed for this construction are the reduction of clearance in the ports, the absence of all lateral pressure against the cylinder and the complete balancing of steam pressure so far as the valve operation is concerned, and facility in securing and maintaining steam tight joints in the working parts.

A Cleveland paper says that the \$50,000,000 invested in lake vessels has paid a profit of between 9 and 10 per cent. for the season. This does not take into account the depreciation of floating property, but covers general expenses and the cost of repairs. The principal advance made is in the construction of elegant modern steamers for lake travel, of which there

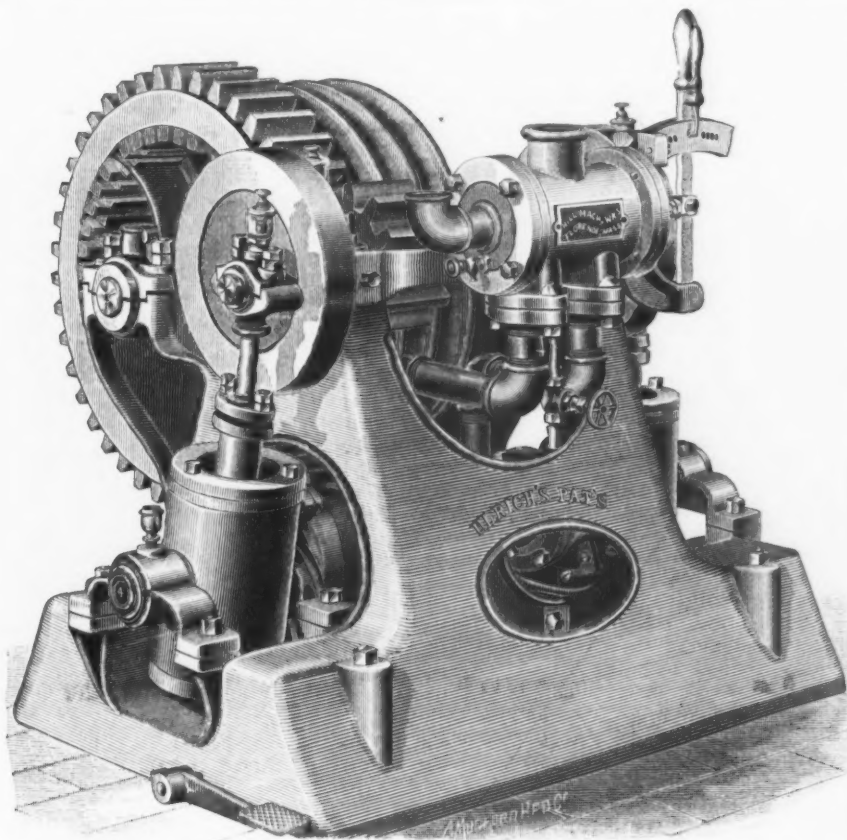


Fig. 1.—Perspective.

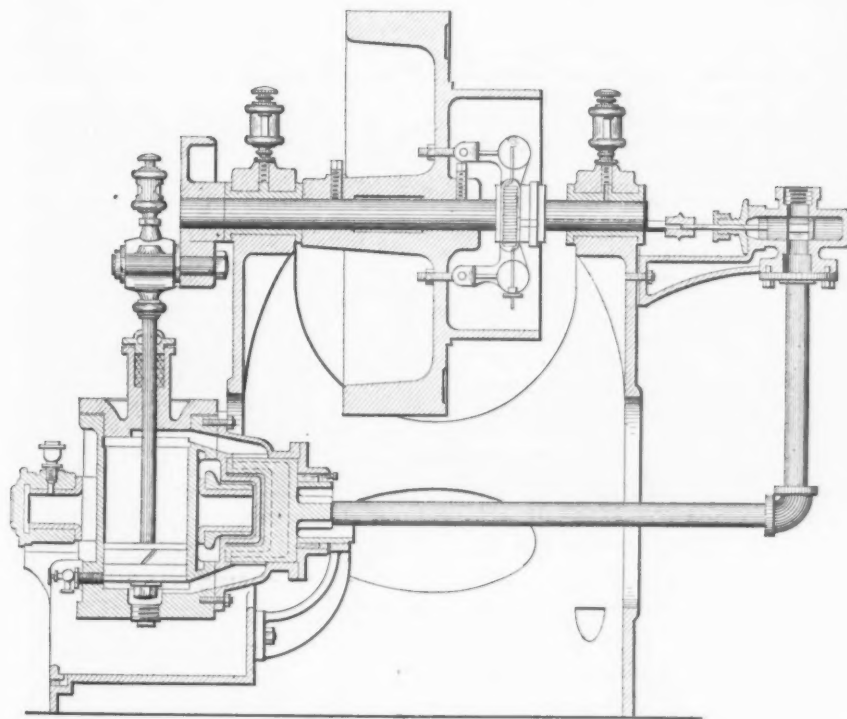


Fig. 2.—Vertical Section Parallel with Shaft.

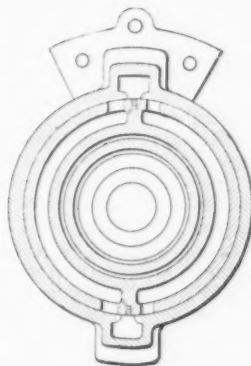


Fig. 3.—Vertical Sectional Detail of Steam Chest and Valve Mechanism.

THE ULRICH OSCILLATING STEAM ENGINE.

trunnions that support it and receive the thrust of the steam that impels the piston. The valve action depends upon the oscillation of the cylinder, by which port openings in a valve piece carried by and oscillated with the cylinder, are caused to

chest is divided by a partition in line with the axis of the cylinder when in dead center position into live steam and exhaust chambers, and live steam and exhaust port openings are formed at each side of the partition, so that the port opening that

are about half a dozen to be finished next spring. Of freight carriers seven 4000-ton craft are under construction. Chicago's marine business shows an increase over that of 1891, but is not equal to the growth at the head of Lake Superior.

The Shipman Marine Engine.

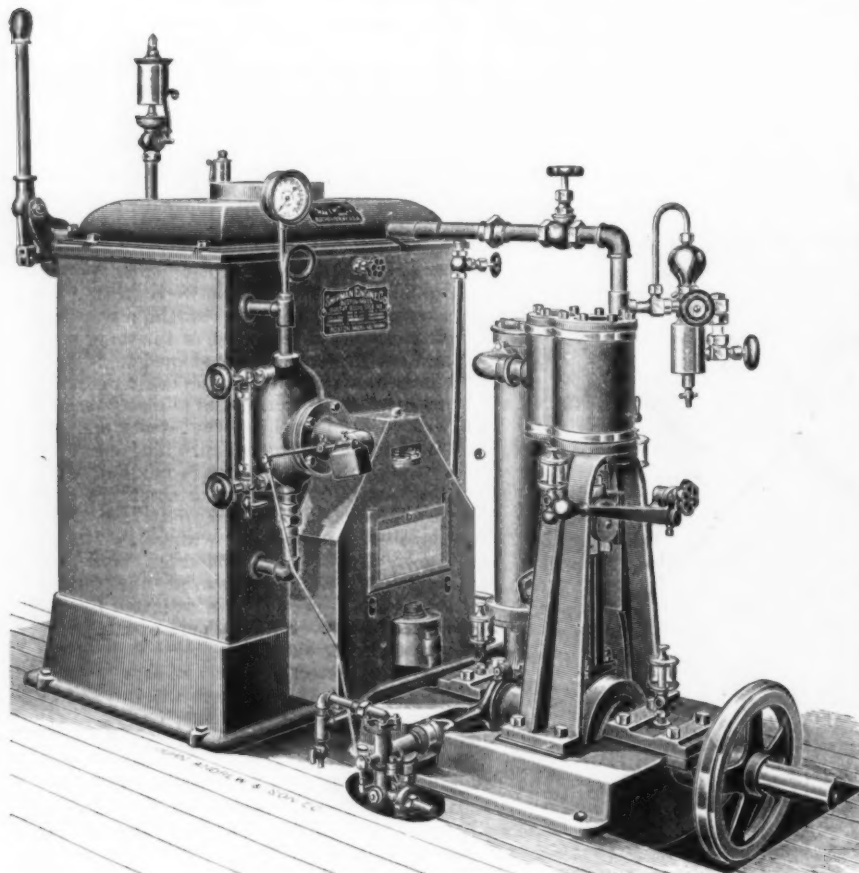
The engraving represents the Boston model of the marine engine built by the Shipman Engine Company of 200 Summer street, Boston, Mass. For convenience in

or falls with the level of the water. The movement is conveyed through a stuffing box and by means of levers to the tap in the suction pipe, which it opens or closes as the water level changes.

The speed of the engine is kept regular by means of a governor, which works di-

atomizers, and for this a hand air pump is provided. A few strokes of this pump will suffice to start the fires, and it is only necessary to pump slowly for five minutes to raise sufficient pressure of steam to keep them going, 15 minutes in all being required to get steam up to 150 pounds per square inch.

These engines are made in sizes from 1 to 6 horse-power and weigh from 475 to 1476 pounds.



THE SHIPMAN MARINE ENGINE.

placing them in boats the engine and boiler are mounted on separate bases, the latter being arranged crosswise the boat with the fires between the engine and boiler. This is a petroleum-burning steam engine which is automatic in operation, so that when once steam has been generated in the boiler practically no further attention is required beyond that of opening and shutting the steam valve whenever the engine is started or stopped; the fire, speed and water feed are so arranged as to attend to themselves. The boiler is composed of tubes which are screwed into a flat, oblong chamber at one end and closed at the other. Two small atomizers, taking steam from the boiler, force petroleum into the furnace in the form of a fine spray. The amount of steam and petroleum used is regulated by a diaphragm connected to a valve in the steam pipe that supplies them.

This diaphragm is exposed to the steam pressure on the one side, and is held down by a spring, loaded to a certain pressure, on the other, and moves upward or downward as the steam exerts more pressure than the spring, or *vice versa*. Its movement is conveyed to the valve by means of a rod, and it thus regulates the amount of steam passing at any moment to the atomizers. In this way the fire is made to vary inversely as the pressure in the boiler, and thus keeps the latter constant.

The petroleum is stored in a tank at any convenient distance from the motor, and is led to it through a pipe having a regulating valve in it. The water in the boiler is kept at a constant level by means of a float, connected to a tap in the suction pipe of the pump. This float is placed in a chamber, which is joined to the top and bottom of the boiler, and rises

rectly on to the eccentric, and the lubricating of all journals, cylinders and slides is performed by the ordinary sight-feed lubricators and cups, except that of the crank pin, which is effected by means of a

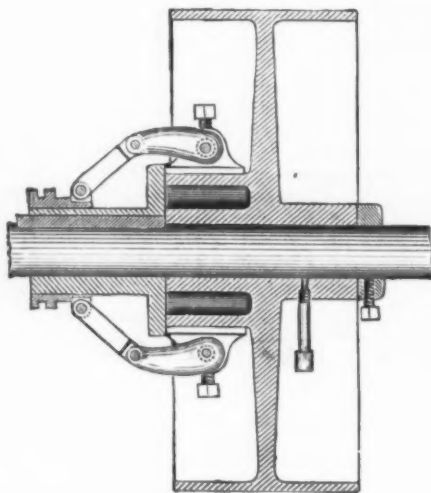


Fig. 1.

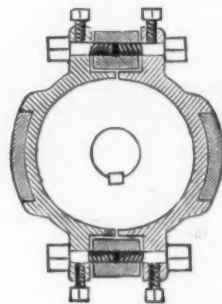


Fig. 2.

BARNES' FRICTION CLUTCH PULLEY.

centrifugal oiler attached to the crank disk. It may be seen from the foregoing that when once steam is up, the fires, the water supply, the oiling and the speed of the engine require no further attention. But when first starting a sufficient pressure is required in the boiler to work the

clutch should ever become lax. They give the pulley a positive grip and absolute release from the hub by each opposite shift of the operating lever, without the use of springs. These friction clutch pulleys and cut-off couplings are adapted to both heavy and light work.

Barnes' Friction Clutch Pulley.

The accompanying cuts illustrate the principle of the construction of a new friction clutch pulley, made by J. H. & D. Lake Company of Hornellsville, N. Y. Fig. 1 is a sectional side view of the Barnes screw lever friction pulley in released position, showing the driving hub keyed to the shaft.

Fig. 2 is a sectional end view of the friction hub encircled by friction ring, the former of which is cast in one solid piece with the pulleys. Projecting lugs on opposite sides of the driving hub of the ring drop into lugs, or lug cavities of the friction ring, and when the clutch is on these lugs take all the driving power.

This is claimed to be an improvement over the old bolt fastening system: the bolts of which are more liable to be affected by the twisting strain upon the hub from the friction of the clutch. At the extreme top and bottom of Fig. 2 is shown a view of a simple device which obviates the use of more complicated machinery. It is a lever nut on each side of the friction ring, one-half of the nut being cut with a right thread and the other half with a left thread. Sufficient space between opposite sections of the ring is given for contraction or clutch, which is effected by means of right and left thread screw bolts entering the lever nut from opposite sides, secured by set screws. Duplex levers are attached to these nuts at their upper section and to the hub at their lower section. When the shipper sleeve is thrown against the flange by the operating lever, the duplex lever turns the nut sufficiently to produce all necessary friction. The screw bolts are adjustable to any desired pressure, however, in case the

The Roberts-Burgess Regenerative Pottery Kiln.

The regenerative principle of securing high heats has been in use for a great many years in connection with heating and melting iron and steel, and it may be said that the progress in the economy of the production of iron and steel of late years has been largely due to this regenerative principle first introduced by Siemens. In

of fire brick is placed, built up so as to leave ample space between the bricks for the passage of the gases, and in plan resembling a checker board. These flues meet and thence continue as one flue to the chimney. At the point where the flues intersect reversing valves are provided, whereby the direction of the flow of gases within the heating chamber may be reversed, the products of combustion passing out alternately from each end. The fuel employed is gas. When one end

making such passage, however, the gas and air are compelled to pass through the brick work which has been previously highly heated as described by the products of combustion, and consequently become themselves highly heated by contact with this brick work—the result being that the major portion of the heat in the escaping products in one operation is returned to the heating chamber through the medium of the gas and air in the next. The reversing process thus outlined is repeated from time to time as may be necessary. The economy in fuel resulting from the use of the regenerative principle is great, and in consequence there is no iron or steel works of modern design which is not equipped in one way or another with furnaces of this description. If, then, this principle has proved of such commercial value in the heating of iron and steel, why should it not be equally so in the burning of pottery ware? Let us examine into the question.

Many costly experiments have been undertaken from time to time with a view to the reduction of the cost of firing kilns. These experiments have been largely confined to the application of some particular kind of fuel. None have proved successful, however—and why? Because, not only is high temperature required (which was secured without difficulty), but large volume of heat is absolutely essential in order to fill the kiln chamber completely and perform the proper distribution of temperature. In regenerative furnaces, as a rule, the gas used for fuel is that known as producer gas, and this gas for a given amount of heat is greater in volume than any other gas used in the arts; roughly, a comparison of different gases may be taken as follows:

	Volume per 140,000 heat units.
Natural gas.....	125 cubic feet.
Coal gas.....	195 cubic feet.
Water gas.....	420 cubic feet.
Producer gas.....	1,000 cubic feet.

Hence, in the use of producer gas, we satisfy the requirements that our fuel shall be such that the heating gases within the kiln shall be of large volume.

It would be impracticable as well as impossible to apply the regenerative principle as used in the iron industry to the requirements of the pottery trade. As has been indicated, the direction of the flow of the gases within the regenerative furnace of the iron works is reversed from time to time within the heating chamber itself. Manifestly this would not be suitable for a pottery kiln. The reversing of the currents would in this case vary the temperature of the two sides of the chamber to such an extent as to introduce serious defects in the ware. The regenerative system, then, in the case of the pottery kiln, must be modified to such an extent as to cause the currents within the kiln to flow continuously in one direction, whereby the saggars and ware will be gradually heated up to the maximum required temperature.

With these principles in view, Frank C. Roberts of Philadelphia invented the kiln which is the subject of this article. The plans were submitted to William Burgess of the International Pottery in Trenton, and he thought so well of the kiln that it was decided to remodel one of the kilns of the company. Owing to Mr. Burgess' familiarity with the manufacture of pottery, he was able to render Mr. Roberts valuable assistance in meeting the requirements involved; in consequence of which, Mr. Burgess is associated with Mr. Roberts in the introduction of the kiln. The plant was completed and placed in operation, and although several difficulties were experienced, they were finally overcome and the system proved capable of a large saving in the cost of firing the kiln. It was clearly demonstrated, however, that much

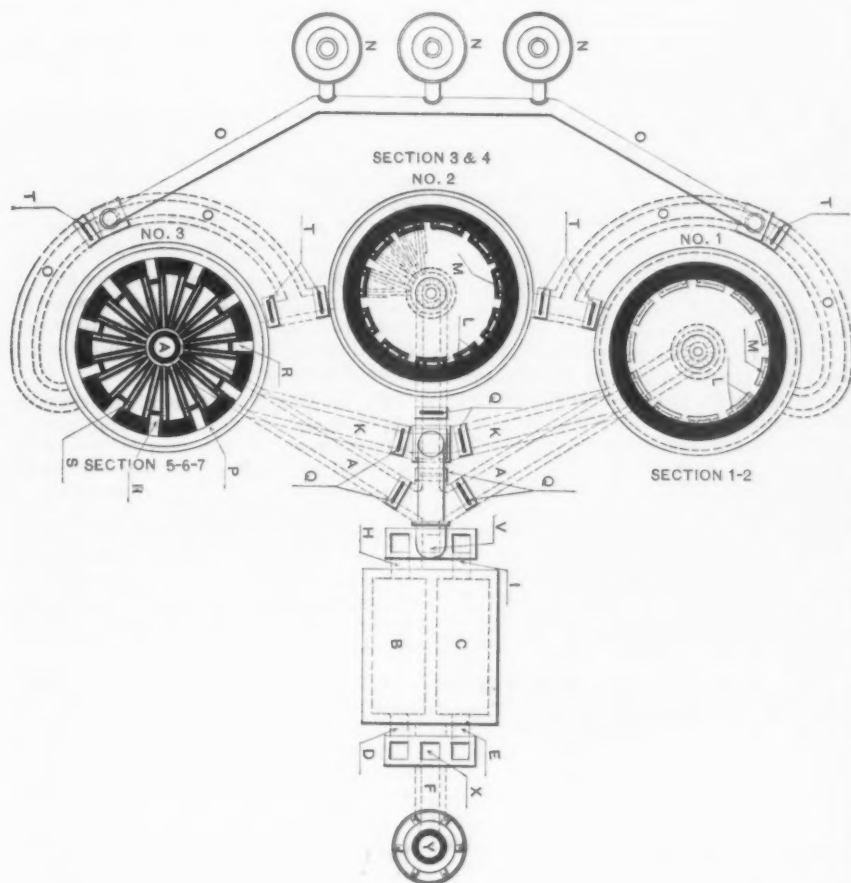


Fig. 1.—Plan of Three-Kiln Plant.

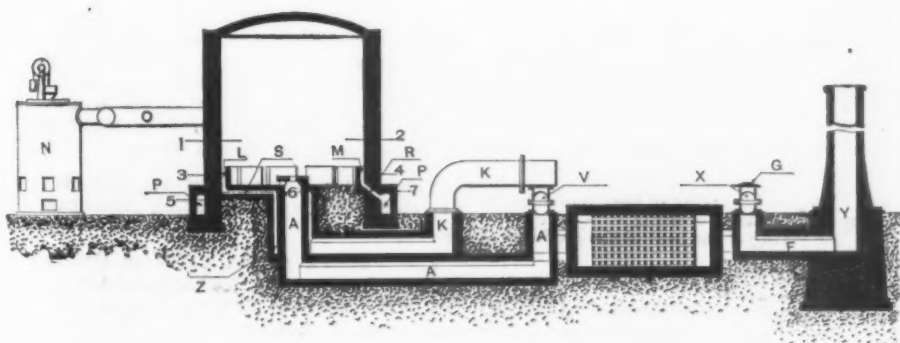


Fig. 2.—Sectional Elevation of Plant.

THE ROBERTS-BURGESS REGENERATIVE POTTERY KILN.

principle the regenerative process depends upon the absorption, by fire brick or other suitable material, of the greater part of the waste heat in the flue leading to the chimney, and the subsequent returning of this heat to the heating chamber by imparting it to the gas and air while passing through this heated brick work on their way to the heating chamber.

In the iron and steel industries the regenerative principle is applied in brief as follows: The chamber in which the heating or melting is to be carried on is provided at each end with a flue leading to the chimney. In each of these flues a mass

of the heating chamber is open to the chimney the other is open to the influx of gas and air, which burn within the heating chamber. The products of combustion pass out of the opposite end of the chamber, and in so doing heat the mass of brick work in the chimney flue to a high heat. At the proper time the reversing valve mentioned above is turned, in consequence of which the end of the chamber which was before open to the influx of gas and air is now connected to the chimney, and that formerly connected to the chimney is now open to the passage of gas and air into the heating chamber. In

better work could be done if the kiln had been constructed entirely anew, and more than one kiln were equipped with the regenerative apparatus. Practically the most efficient and least expensive arrangement of plant would be to employ but one pair of regenerative chambers for three kilns. By this means while one kiln is being fired another can be filling and another discharging. By this arrangement the regenerative chambers and gas producer are in use continually, thus effecting a large saving in heat over the single kiln at Trenton; where on completion of the firing the producers are stopped and the regenerative work of necessity allowed to cool.

Fig. 1 shows the plan of an arrangement of a plant of three kilns operated with one set of regenerative chambers in which the air is preheated, while Fig. 2 shows a sectional elevation of the plant taken through the chimney, regenerative chamber and one of the kilns. In Fig. 1 the kilns are represented by sections taken at different elevations, as may be noted by reference to the plan. The same letters on Figs. 1 and 2 represent the same parts in each case. The draft for the operation of the kilns is supplied by the chimney Y. The products of combustion are drawn out of the kiln through a central and several radial openings located in the bottom, and thence pass through flue A to the reversing valve V, which valve controls the direction of the flow of the products by diverting them through flues H or I into regenerative chambers B or C, as may be desired. The major part of the waste heat in the products of combustion is thus absorbed by the brick work in chambers B or C. Beyond these chambers and connected thereto by flues D and E is located another reversing valve, X, by means of which either of the regenerative chambers B or C is connected to the chimney Y through the flue F. So much for the outflowing products of combustion, the heat of which may be absorbed by either chamber B and C. The air for the combustion of the fuel in the kiln is drawn by the chimney draft into the system through the opening G in reversing valve X, and is regulated by a damper, as indicated. The reversing valve X deflects the air into either regenerative chamber B or C, where it becomes heated by contact with the hot brick work. Thence it passes through either flues H or I to the reversing valve V, which valve governs the flow of heated air from the chamber B or C just as the valve X controls the flow into either chamber. From this valve V the heated air passes by means of flue K to an annular chamber, Z (see Fig. 2 and kiln 3 in Fig. 1), located in the center of the kiln and under the bottom, from whence it is carried by means of radial flues S (see kiln 3, Fig. 1), located directly beneath the floor of the kiln, to the openings L into the kiln, one of which openings is located on each side of the gas opening M. Attention is called to the fact that the radial flues S contribute largely to a "hot bottom." The design of the bottom is not limited to radial flues, however; any approved style of bottom may be used. The foregoing description covers the process by which the major part of the waste heat in the products escaping from the kiln is returned to the kiln.

Gas is manufactured in gas producers N and carried from thence to each kiln by flues O. Around the base of each kiln there is a circular gas flue, P, connected to the flue O at two points. From this flue, P, the gas is admitted to the kiln by the small flue R and the gas opening or burner M.

In order to render the matter somewhat clearer, the operation may be described, assuming that the regenerative chamber B has been heated and connected to air and that kiln No. 1 is being fired. The gas

passes from the producer N to the gas burners M by flues O, P and R. Air is now necessary for combustion and is drawn by the draft of the chimney through opening G, valve X, flue D, regenerative chamber B (where the air is heated), flue H, valve V, flue K, to the chamber Z in center of kiln No. 1, from whence it is distributed to the air openings L by radial flues S, directly under the bottom. Thus air is provided for the combustion of the gas and the products of combustion are formed. These products are drawn by the chimney out of the kiln by means of a central and several radial openings in the floor to the flue A through valve V, flue I, regenerative chamber C (where their heat is imparted to the brick work), flue E, valve X, flue F and out of the chimney Y. From this description it is apparent that the direction of the flow of gases within the kiln is continuously in one direction and this important condition is thereby satisfied. Attention is also called to the fact that by a proper operation of the valves Q the heat remaining in one of the kilns on completion of firing may be used to heat the air required for the drying of the kiln about to be fired.

The plant has been described in which only the air is preheated for the reason that there are a less number of valves and regenerative chambers than that where both the gas and air are preheated; the principle is exactly the same, however, the chambers, flues, valves, &c., for heating the air being duplicated, thus providing a separate similar system for heating the gas. In order to disconnect the kilns not being fired from the regenerative chambers cut-off valves Q are provided in each flue; likewise cut-off valves T control the connections of the three kilns to the gas producers.

The gas may be manufactured in any first-class producer; that in use at Trenton is the Taylor gas producer, which has given great satisfaction. The coal used is anthracite pea coal; the use of this coal effects a large saving itself in the cost of firing a kiln, the cost per ton being about one half that of the coal usually employed at Trenton.

In regard to cost of plant, it may be mentioned that the kilns themselves cost about the same as the kilns in use at the present time, and when the cost of a single regenerative system with producers is divided between three kilns, the individual cost per kiln of the regenerative system is comparatively small.

The application of the regenerative system to pottery and other clay-burning kilns leads to economy along the following lines:

- (a) The possible saving of heat remaining in a kiln on completion of firing.
- (b) The saving of the heat of the products of combustion.
- (c) Reduced cost of fuel per ton.

The experiments at Trenton have demonstrated that the regenerative system applied to pottery kilns will lead to results as satisfactory in economy as any secured by the application of the system to the iron and steel industries. As already stated, the conditions at the Trenton kiln are not at all favorable, the works being located on very low ground, and as a consequence there is water in the bottoms of the flues most of the time. Notwithstanding this, the last recorded test gives a fuel consumption of but 9 tons of low-grade coal, showing a saving over the old methods of direct burning of over \$45 per firing.

The principles involved in these kilns are applicable to a variety of purposes aside from that already referred to, and the promoters hope shortly to introduce the system into other fields of manufacture. These kilns are covered by patents, and it is the intention to allow their use by potters and other establishments on a royalty basis.

THE WEEK.

An examination by Government inspectors shows that the two transport steamers built at Toledo for service on Lake Michigan can be quickly converted into powerful war vessels if armor is kept in readiness for immediate assembling. Each vessel is 267 feet long and has three sets of compound engines operating triple screws.

The new cruiser "Bancroft," built at Moore's shipyard in Elizabeth, N. J., made a successful trial on her preliminary trip, developing a speed of 12 $\frac{1}{10}$ knots per hour with 150 pounds of steam.

Several million dollars' worth of lands situated between Colorado River and the Pacific Ocean, which were granted to the Atlantic & Pacific Railroad Company, and which the Southern Pacific claimed to have succeeded to, have been forfeited and restored to the United States domain.

The Minnesota Iron Company have resolved to build a line of road between Duluth and Two Harbors in a northwesterly direction, straight into the heart of the Mesaba iron district.

The Sinking Fund Commissioners prosecuted their inquiry concerning the so-called Green bridge project across the North River, and the fact was elicited that it includes 28 miles of approaches, of which 9 miles are in New York City. The City Chamberlain remarked that the bridge "seems to be an incident of a complete railroad system." This inference was drawn from maps produced by Engineer Brush. So the bridge prospects were not improved.

It is reported in Mexico that a combination of all the iron works of the country will be effected within a short time, the object being to establish there under the recently decreed moderate protective duties an iron industry on a large scale.

The United States Minister at Bogota has informed the Secretary of State that the Atlantic ports of Colombia have been opened to vessels from European ports, and that no action has been taken in regard to vessels from United States ports.

Shanghai advices as late as October 28 refer to the difficulty of arranging terms of exchange with Europe as preventing contracts for the future delivery of goods. The prices current in China for cotton goods were almost absolutely prohibitive of imports from the United States.

Three mills in Hamburg are now employed exclusively in grinding American corn.

The influence of the Canadian Pacific Railway in diverting traffic from American lines appears to have been much overrated. A. C. Raymond of Detroit, in an argument before a congressional committee on this subject takes direct issue with several statements in President Harrison's message which he controverts in a display of figures, concluding as follows: "The fact is that American transcontinental lines have diverted from the Canadian Pacific a much larger percentage of purely Canadian transcontinental traffic than the Canadian Pacific has of purely American traffic from the American lines. The books of the transcontinental associations show that in 1891, while eighty one-hundredths of 1 per cent. of American west-bound traffic was diverted from American lines, 13.73 per cent. of Canadian traffic west-bound was diverted to American lines, and while twenty-three one-hundredths of 1 per cent. of American traffic east-bound was diverted from American lines, 12.10 per cent. of Canadian traffic east-bound was diverted to American lines. Such

facts as these go to prove that upon no public question does there exist greater misapprehension than upon that concerning the relation of the Canadian Pacific Railway to its American competitors.

There are 30 firms in the New York State Cannery Association.

Austin Corbin now modifies his tunnel scheme for the purpose of connecting the Long Island Railroad directly with the Pennsylvania Railroad by means of a tunnel about six miles long through the intermediate distance. Access from the surface will be had at several stations midway in Brooklyn and New York, besides those at the extreme termini. The estimate of \$10,000,000 cost is supposed to be moderate. The supposition is that the tunnel would supersede the ferry boats in through travel. Mr. Corbin claims to have the support of the Pennsylvania Railroad Company and several heavy capitalists.

The gigantic engineering enterprises of a local character talked about in New York and some of which have been reduced to a definite plan make a formidable list when considered in the aggregate. There are plans for two tunnels under the East River, one tunnel under the Hudson, two bridges, one a suspension and the other a combination of pier and cantilever, over the Hudson; for two bridges over the Harlem River, for a great union station in the heart of the city, which shall occupy many blocks and perhaps take in the site of Columbia College, and for building the largest aqueduct dam in the world, to cost \$5,000,000 or \$6,000,000. In addition to this there are the perfected plans for the underground railway, cut along the backbone of Manhattan Island, extending as far north as Yonkers.

The Colombian Government has granted a large cash subsidy to an American railroad corporation with headquarters in Boston, also 400,000 acres of land and exclusive privileges of the harbor of Cartagena.

The New York Sinking Fund Commissioners unanimously oppose the North River Bridge scheme now before Congress. They object to encroachment on the river front.

The engineers both of the Cramp Company and of the International Navigation Company are perfecting their plans for the new steamships to run as consorts of the "City of Paris" and "City of New York" when they shall have been placed under the American flag.

One of the original iron steamboats, the "Richard Stockton," built by the Harlan & Hollingsworth Company 41 years ago, is still doing good service. At least four American wooden ships might be named which have been in the trade about half a century, including the "Columbia," formerly of the Black Ball Line to Europe, which was built by Wm. H. Webb in 1841.

The first experiment in shipping Florida oranges to Liverpool was financially successful and is supposed to be the beginning of a large trade.

The Fortifications bill this year appropriates less than \$2,000,000, and the report has gone out from the House of Representatives that the River and Harbor appropriation bill will be merely nominal in amount.

The renewed outbreak of cholera at Hamburg shows that measures to restrict immigration were taken none too soon. Furthermore, it affords an urgent reason for perfecting sanitary precautions at all ports of entry into the United States lest there be another cholera invasion early next year. On the other hand, restricted immigration does not mean a total suspension of immigration. Immigrants have

made this country what it is and the labor of immigrants is essential to its highest prosperity.

The two great wings of the workingmen's organizations, the American Federation and the Knights of Labor, are unable to agree. At the annual convention of the Federation, held in Philadelphia last week, the committee in charge of the resolutions to investigate the differences between the Federation and the Knights of Labor reported that all efforts to heal the breach between the two organizations while the latter continues its attacks on the Federation are impracticable. Whenever a crisis occurs the two elements will not mix for a common purpose.

Not only Cornell, but Yale and Harvard, will each have an aluminum shell boat for fast rowing.

The first sod preparatory to building a railroad to Damascus has been cut.

Cotton planters are warned by Southern editors lest the remunerative prices now realized for their staple result in an increased acreage another season.

The manufacture of big guns for the navy proceeds more rapidly than the supply of armor plates, for while Secretary Tracy's report shows that 237 guns have been completed only 116 are yet afloat.

The Southern States are not in sympathy with the movement for the restriction of foreign immigration. The need of settlers in that region is greater even than the need of capital. A New Orleans paper says that millions and millions of acres of the finest land, in an unexcelled climate, still lie uncultivated in the South, waiting for the steady and industrious settlers, whether from the less favored regions of the Northern States or from the nearly exhausted countries beyond the Atlantic, to come in and take possession. A meeting of State Governors is proposed to consider the subject.

New buildings erected in Boston during 1892 cost \$7,283,000, which shows less activity in improvements of this class than during 1891, when the expenditure was \$1,361,000 greater. Few notable edifices have been added lately.

A cotton crop of 7,000,000 bales this year at present prices would be valued at \$294,000,000, against a total value last year of \$328,000,000, a decrease of \$34,000,000.

While New York secures the great bulk of the imports of the entire country on account of its facilities for distribution, equaled nowhere else, southern seaports are enabled to control a full share of the exports, as shown by the following figures for the last two months:

	Imports	Exports.
New Orleans.....	\$19,400,000	\$85,400,000
Baltimore.....	11,700,000	78,100,000
Galveston.....	800,000	19,100,000
Savannah.....	100,000	13,400,000
Newport News.....	100,000	9,300,000
Charleston.....	200,000	7,300,000

It will be seen that the total of imports amounts to little more than one seventh of the amount of exports, and that in some cases the disproportion is much greater, while for the entire country for the ten-month period the aggregate imports were but \$20,000,000 less than the exports.

Figures from Washington indicate that there are least 1,000,000 Canadians who have crossed the boundary to live in the United States. Without waiting for the slow process of political annexation individuals annex themselves.

A model tenement building just erected in Philadelphia by an association is of slow burning construction, the floors throughout being laid upon joists of iron and filled in with cement. Light shafts are abolished.

The threatened trouble on the New York Central Railroad appears to have been adjusted, mainly through the intervention of Chief Arthur of the Locomotive Engineers, although the rate of wages is supposed to be arranged independently of that organization.

The tower of the new City Hall in Philadelphia will cost \$700,000, making the total cost of the structure \$4,016,790.

The increased profits of cotton manufacturing are an incentive to the erection of new mills in every direction. Projects for new mills or enlargements are very plenty in all the cotton States.

A number of American capitalists are reported to have purchased several million dollars' worth of San Domingo bonds, accepting a lien on the customs revenues of the Republic as security.

The population of Philadelphia, as shown by the police census just taken, is 1,142,653, an increase of 95,689, or about 9 per cent., over that given in the Government census of 1890, and an increase of 295,483, or nearly 45 per cent., over the figures of 1880.

The Gatling Plant.

Final arrangements have been completed at Buffalo, N. Y., for the location near the city of the large plant of the Gatling Ordnance Company, manufacturers of the largest fort and ship guns known. Dr. Gatling recently organized a new company for the manufacture of heavy ordnance according to a process invented and patented by him. The company will locate at Idlewood, about 7 miles south of the city limits, on 20 acres of land. There are excellent railroad facilities there. The company have a capital of \$1,000,000, and the plant will cost about \$100,000 to build and put in operation. Work on it will be begun within 30 days, and it will probably be finished within six months. From 400 to 1000 men will be employed the first year.

The company have secured the first floor of 24 Erie-street, Buffalo, which will be used as offices the first year. Secretary M. F. Frank of New York and Treasurer F. W. Prince of Hartford, Conn., will soon go to Buffalo to take charge of the company's affairs. Among the stockholders are: Col. Robert G. Ingersoll, D. B. Wesson, Springfield, Mass.; W. H. Webb, New York; C. H. Jackson, New York; the Flynn estate, the Newton Case estate, of Hartford, Conn.; E. H. Carmick, New York; Godfrey Mannheimer, John Dwight, W. G. Schuyler, New York; W. L. Shafer, Pottsville, Pa. Dr. Gatling says that the works will not be connected with the Gatling machine gun works at Hartford. Heavy ordnance, guns weighing from 30 to 50 tons, will be manufactured. The new process is to cast them all in one piece. Dr. Gatling says that he can demonstrate that a solid gun, made of a composition of steel and other metals, will stand more strain than a built-up gun. His guns will be cast all in one piece, and will be cooled from the center. In addition, the company will manufacture heavy steel castings, steel rails, steel plate for armor, car wheels and heavy steel machinery. There will be three pits of furnaces.

The Baldwin Locomotive Works of Philadelphia have been liberal contributors to Sibley College, a part of Cornell University, Ithaca, N. Y. The management have just sent to the director of the college a set of lantern slides representing the latest and most remarkable of the new compound engines, designed by Mr. Vanclain, and details of their construction, to be used in regular lectures on the structure of the steam engine.

The Iron Age

New York, Thursday, December 22, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
 CHAS. KIRCHHOFF, - - - EDITOR.
 GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
 RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
 JOHN S. KING, - - - BUSINESS MANAGER.

Labor and the World's Fair.

A perfect tempest has been raised in labor circles by the World's Fair authorities in Chicago. It is claimed that the printing of the official catalogue of the exposition was awarded to the W. B. Conkey Company of that city without the formality of asking bids for the privilege and that this company have been conspicuously opposed to typographical unions. Representatives of trades unions have vigorously protested against the award and threaten all sorts of direful things if it is not withdrawn. The unions go so far as to proclaim a boycott on the fair and everything connected with it, if the demands of "organized labor" for the annulment of the award are not forthwith conceded by the exposition authorities.

The claim is made by the latter that the terms upon which the publication of the catalogue are to be undertaken by the company are more favorable for the World's Fair treasury than could possibly be obtained from any other printing house of the high business standing of the W. B. Conkey Company. The further claim is made that but 2 per cent. of the entire cost of the catalogue will be incurred in the wages to be paid compositors to be engaged on it and that therefore the row over the award is unreasonable. The unions, however, are fighting it as a matter of principle, on account of the stand against them which has been taken by the publishing company in the past.

Even if this trouble between the unions and the exposition management is amicably adjusted, it will be very remarkable if some other grievance against the fair is not sprung before it opens which will array organized labor against the enterprise. From its inception the labor agitators have endeavored to make capital for themselves among their followers on the slightest pretext. They have interfered with all sorts of arrangements and meddled with all kinds of contracts, persistently attributing to the managers the willful ignoring of the regulations of organized labor. They have been respectfully treated and their demands have been complied with to the extent of interfering seriously at times with the rapid progress of the work of construction. But they are insatiable. They must have control of everything. If their "rights" are abridged in the least degree they at once threaten a boycott. The award of the catalogue contract privately to the W. B. Conkey Company may not be defensible as a business transaction, but the outcry over it from the unions that it is a direct attack

on them is childish and ridiculous. They are pushing the claims of "organized labor" too far, and have already aroused public sentiment against their attempt to monopolize employment under World's Fair contracts for their own membership. It is time that the reasonable element among the unions haul up their ridiculous "leaders."

The Western Wheat Avalanche.

Wheat has never before sold so low in New York and Western markets as during the past autumn, and there has since been only a slight recovery. This is attended with important consequences as concerns both the agricultural interest and our foreign trade. The constant increase in the visible supply of wheat at Western sources and low prices resulting has perplexed the best authorities. Whether the yield of wheat for the season of 1892 has exceeded the estimates of the Department of Agriculture, or whether the farmers are getting rid of their reserves with unusual dispatch, is a question that opens a wide field of inquiry, and none are watching for a conclusive answer with more eagerness than the foreign buyer. The stunning fact that commands attention is that we have the largest available wheat supply on record, footing up 105,086,000 bushels at the beginning of December, including stock on the Pacific Coast and in Canada, which is 44 per cent. larger than it was a year before. The rapid marketing of the crop east of the Rocky Mountains confounds all calculations. On the New York Produce Exchange the theory commonly accepted is that wheat growers found themselves loaded with a large amount of old stock which the wisecracks of the Farmers' Alliance had advised them to hold, and the market continuing to grow worse rather than improving, necessity compelled them to sell. In not a few instances, it may be supposed, bankers who had advanced money were not willing to extend their loans on a shrinking collateral.

The effects of a glutted market and low prices are peculiarly ill timed in reference to the balance of foreign trade, as it becomes necessary to ship gold in lieu of grain and cotton, and at a juncture when common prudence, if there were any option in the matter, would dictate the hoarding of gold resources to the utmost.

The silver discussion is fraught with possibilities which it were vain to ignore. The latest export statement from the Bureau of Statistics at Washington shows that there was a decrease of nearly \$7,000,000 in the exportation of breadstuffs from the United States during the last month as compared with November, 1891. Our total exports last month were \$17,450,000, as against \$24,588,000 in 1891. The chief falling off is in wheat, which dropped from \$15,716,000 to \$9,199,000. Besides the decrease of \$7,000,000 in breadstuffs, was nearly \$10,000,000 decrease in the value of cotton exported, which was partly offset by an increase of about \$2,000,000 in provisions and petroleum.

The encouraging facts in this connection are that the enormous exports last year were exceptional, for present purposes of comparison, and that as a whole American products are in demand in Europe with little abatement. Were it not for the return of American securities to an extraordinary extent, which is commonly attributed to distrust of the outcome of the silver question, though the paralysis of trade abroad might sufficiently account for it, the outflow of gold would not take place, or if it did, would be regarded with unconcern.

A Two Years' Fair.

As usual, the question of preserving the World's Fair buildings at Chicago as one of the attractions of the city is now coming up for discussion. There has probably never been a great exposition with its special buildings of enormous extent and more or less pretension to architectural beauty that has not suggested this idea to the persons interested. It does seem a heartless and woeful waste of money to lavish millions on structures only intended for a season's occupancy. The Chicago buildings being confessedly superior in size and adornment to anything of their kind, the regret of the Chicago people that they should be doomed to destruction next winter is perfectly natural. Suggestions are now being made that while many of the buildings can and should be removed some of the largest and finest ought to be preserved. A few enthusiasts have even gone so far as to advocate a World's Fair for two successive years instead of confining it to six months of 1893. The experience of all cities that have attempted to maintain so-called permanent expositions is unfavorable to such a scheme. The great attractiveness of a World's Fair arises from the fact that a host of exhibitors are stimulated to put forth their very best efforts at a particular time. This requires somewhat elaborate preparation, much thought and considerable expense. Exhibitors would not do this two years in succession. There would be no freshness to the second year's display, and with this known the attendance would be light, and financial failure would result. The glory of the first year's achievement would be sadly eclipsed by the inglorious ending of the second season.

The Mesaba boomer seems to be getting in his fine work, to judge from a lengthy letter printed over the initials of F. W. in the *New York Times*. The wicked iron masters of the country have persisted in enlarging their plants at interior points, paying unnecessary freight on Lake Superior iron ore, when they ought to tear up their establishments by the roots and transplant them to the lakes. Pittsburgh, Wheeling, Johnstown, the Shenango and Mahoning valleys, have shared in this outrageous conspiracy, but, strange to say, have been thriving. Cleveland and Chicago have failed to wipe them out, and

Duluth and Superior are only gaining a foothold. The reason why the lake cities have not thus far succeeded in annihilating the interior iron-making towns is that they have failed to realize the beauties of the double-barreled scheme which the Mesaba amateur expert explains in the following final climax of his article:

Suppose that a reduction of tariff on iron and steel should cause the removal of iron-producing works to Erie, or Buffalo, or Cleveland. Then suppose the new works should be built in twin plants, one at the head of Lake Superior, the other on the lower lake. Then let the vessels that carried fuel to the Lake Superior works carry back cargoes of iron ore to be smelted in the Eastern furnaces. How cheaply could iron and steel be made? Here is the cost of Mesaba hematite laid down at Cleveland:

Mining	\$0 60
Royalty55
Railroad80
Vessel	1.00
Insurance and commission20
Total	\$3.15

The same ore at the head of Lake Superior would cost \$2.15 per ton. Thirty-two hundred pounds of this ore and 1 ton of coke will produce a ton of iron or of steel. Given this cheap ore and our producing works situated on the shores of the great lakes, our iron-masters can produce steel rails for \$12 per ton and they can capture the markets of the world. Reduce the tariff, force the iron producers to move their plants to the proper sites, where they can produce with the greatest economy, and they will then cease to be parasites, and will be transformed into useful citizens of the Republic.

The Electric Motor and Machine Design.

Two or three years since it would have required a careful search to find an electrically driven traveling crane, and yet now they are a part of the equipment of almost all of the new shops and also of remodeled old ones. This industry has become so important as to cause the establishing of concerns for the special manufacture of electric cranes and has compelled makers of other styles of cranes to add this branch to their business.

We find that the electric motor, as applied to the driving of machine tools, is now in its evolutionary stage. It is forcing its way into the machine shops, but with only two or three exceptions it appears merely as a special appliance intended for some particular operation. In the De La Vergne erecting shops, recently described in *The Iron Age*, electric motors furnish all the power needed, and the same is true of the extensive establishment of Fraser & Chalmers of Chicago, who now have an aggregate of some 350 horse power in electric motors distributed through the works.

The electric motor has proved to be as reliable as and more economical than the line shaft. The electricity is conducted from the dynamo to the motor without an appreciable loss, and when the motor stops there is no loss because of useless motion. Having these decided and accepted advantages we must look to other causes for its comparatively insignificant employment. Of these we shall

consider but one, which is, we think, the chief—the high speed of the motor itself. To apply the motor to the running of large tools such as lathes, planers, boring mills and the like, where the cutting speed is very low, one of two things is necessary—either we must employ countershafting between the motor and machine to reduce the speed, or the driving gear of the machine itself must be so proportioned as to provide this reduction. The former is by no means an ideal arrangement, yet it is the only one now in vogue. The motor should be carried by the machine to which it supplies power and all outside belts and gears should be discarded. To reach this perfected condition we must either reduce the speed of the motor without increasing its size or lessening its power, or the machine must be so geared as to permit the use of the motor even at its present high speed. So far as the first requirements are concerned, electricians the country over are now studying the problem, and to say that they will not ultimately succeed would be presumptuous. The second question depends solely, we think, on the future demand created by the electric motor. If there should arise a market for a machine geared and adapted to be run by an electric motor, making, say, 1000 revolutions per minute, then the tool builders would meet the demand quickly, and would introduce the necessary gearing. We do not think it probable that machine tool builders will change their design to accommodate the motor simply for the sake of introducing a tool carrying in its own frame the device needed for driving it. In other words, tool builders will not push the introduction of the motor, for the simple reason that they have nothing to gain by so doing. Their machines require just so much power to run them, and the source of that power, whether line shafting or electricity, is, in itself, of no interest to them.

The user of the tools, because of the saving to be derived, will advocate the motor, and if this demand ever becomes of sufficiently widespread importance to justify it, then the builder will modify his tool to meet the requirements of the motor. He will do this by placing the motor on the tool, thereby doing away with the inconvenient, unsightly and power consuming countershaft.

In order to accomplish this it would be necessary in all cases to redesign driving gear, and in some instances to remodel the entire tool. At the present time we doubt if a line of electrically driven machine tools would "take." The average mechanic has no leaning toward an excessively high speed power; he has become accustomed by long usage to a speed of from 100 to 120 revolutions. He will not take kindly to a tenfold increase. For this reason alone he would regard with suspicion a tool driven direct by a motor. It will therefore depend upon the user, whose pocket is most directly affected, to first employ the motor. The question is an exceedingly interesting one, and one that will compel close study and attention in the near future.

The World's Fair Steam Plant.

Another contest over the World's Fair steam plant has just been settled—that is, to some extent. There is a probability that it may go further. It appears that in the apportionment of space in the boiler room of Machinery Hall last spring the Stirling Company of Chicago, who are manufacturers of water-tube boilers, were omitted, although they had made an early application for space, and had also made what is understood to have been the lowest bid for supplying the steam power that might be required. The steam plant contemplated covered 24,000 horse-power, but not all of it was at once called for by the fair management. The allotment was as follows:

	Horse-power
Babcock & Wilcox	2,800
Campbell & Zell	3,750
Gill	1,500
Heine	3,750
National	1,500
Root	1,500
Total	14,800

Some power was reserved for such foreign boiler manufacturers that might be willing or desirous of securing room on the same terms in order to exhibit their boilers in actual use. The terms were about \$5 per horse-power, to be paid by the World's Fair, while the manufacturers were to pay for foundations and setting, provide skilled attendance and remove the boilers after the fair had ended. This compensation was understood to about cover the cost of foundations, setting and attendance. The foreign manufacturers have not displayed the interest expected, and the domestic manufacturers have recently been called upon to supply the additional horse-power desired.

The Stirling Company had endeavored in every way for five months to secure a foothold without success. They were omitted from the original allotment, no arrangement could be effected for a change in the plans afterward to admit them, and they perceived that they were in a fair way to be excluded from the additional allotment recently decided upon. An appeal was therefore made to the Council of Administration for fair treatment, and the result is that a contract has been made by the management with the company for boilers to develop 1600 horse-power. It will be seen that more power is still to be awarded, and the probabilities are that it will be taken by the Babcock & Wilcox Company.

For some reason, however, considerable feeling exists among the other water-tube boiler manufacturers over the turn affairs have taken, and it is stated that some have gone so far as to threaten to withdraw from their contracts. If this should be done, the Stirling Company state that they will furnish on the same terms as much power as may be needed even if they should be obliged to supply the whole plant.

The Stirling Company assert that they have been discriminated against from the beginning of the negotiations for boilers, notwithstanding the fact that theirs is the only water-tube boiler company incorpo-

rated under the laws of Illinois and having their main office in Chicago, while their competitors are all outside corporations maintaining only branch offices in that city. The merits of the controversy may not be in full view, but it would appear that the Stirling Company have been simply contending for justice in carrying their appeal to the Council of Administration. Their boiler is now very well known in important sections of the country, having secured sufficient standing among steam users to be entitled to recognition in such an important exhibit of boilers.

The disgraceful neglect of the condition of the Patent Office by Congress still continues. Two hundred and seventy occupants of the Patent Office at Washington are crowded into 48 rooms, with a cubical capacity of 247,441 feet. This allows 916 feet per occupant, when 4200 cubic feet is pronounced necessary for each person in a room with "ordinary ventilation" for two consecutive hours of occupancy. However, there is little hope that much will be done so long as there is danger concerning the postmastership of Podunk, or a harbor is needed for Frog Center.

PERSONAL.

S. A. Ford, who resigned his position of chief chemist at the Edgar Thomson Steel Works some time since, has been presented with a silver tea service by his former fellow chemists. Mr. Ford departed for Florida last week to spend the winter.

B. H. Rubie of the McClure Coke Company, Pittsburgh, returned last week after a two months' visit in Europe.

D. W. Davis, formerly salesman and superintendent of Buckeye Engine Company, has taken charge as manager of Western branch office of the Phoenix Iron Works Company of Meadville, Pa., manufacturers of automatic simple, compound and triple expansion engines, and is located at 418 Chamber of Commerce Building, Chicago, Ill.

Frederick H. Lewis announces that he has resigned his position as manager at Philadelphia for the Pittsburgh Testing Laboratory to take an interest with Booth, Garrett & Blair in the organization of a new department of mechanical testing and inspection.

At the monthly meeting of the Board of Directors of the Thomas Iron Company, held at Hokendauqua, Pa., last week, W. C. Alderson of Philadelphia, recently treasurer of the Lehigh Valley Railroad Company, was elected treasurer of the Thomas Iron Company.

Otis H. Childs, who on July 1 last was appointed to the position of assistant to Chairman H. C. Frick in the armor plate department of the Homestead Steel Works, has resigned his position, and Millard Hunsiker, engineer of tests, has been appointed to the vacancy. Mr. Childs, accompanied by his wife, has departed for the Bermuda Islands to seek a much needed rest.

Wm. Murray, formerly chemist for the West Duluth Furnace Company, West Duluth, Minn., has been appointed chief chemist at the Edgar Thomson Steel Works, to take the place made vacant by the retirement of S. A. Ford some months since. Mr. Murray took charge of the laboratory at Braddock this week.

CORRESPONDENCE.

The Conservatism of English Workmen.

To the Editor: Now that the political wrangle and strife are over and the victorious party will soon distribute the rewards, which for the past months have been the plums of contention, and now that the campaign orators with their positive arguments and "reliable statistics" to prove that their party platform is the only true form of government are heard no more, I would like to ask my fellow workmen where do we come in; where do our benefits materialize? We are told to wait, that the promised changes will come, but our public benefactors seem to have forgotten many obligations and really appear to be contending with each other, pushing and crowding in their selfish haste to secure a "public trust." A most deplorable spectacle! How anxious they seem to be to serve the people! It is the same old story, irrespective of party or principle.

According to our liberators' promise, it is quite certain that under the new régime we will be more closely allied to foreign workmen. It might, therefore, be interesting to hear something of the customs peculiar to our cousins across the water, such as a limited personal experience has afforded.

I call your attention to my personal experience only, and make mention of facts as found by me while engaged in superintending iron construction near London. My remarks are not to be taken as general, and I sincerely trust there are great exceptions to the many rules and methods that came to my notice. Compared with our quick and enterprising methods, the slowness and apparent indifference of English workmen are maddening. The persistency with which they cling to ancient methods, their utter disregard for anything modern or improved, and the lack of all desire to advance are sure to create an unfavorable impression in the mind of a modern mechanic.

It is an impossibility to "drive" them. Just so much time must be expended, and in a certain way, or failure is the inevitable result. One of my greatest trials was to introduce the useful, though harmless, monkey wrench to my assistants; but they would intuitively resort to the pile of solid wrenches or "spanners," and after repeated trials the correct size was discovered and used. My innovations in the tool line were hardly soiled except by my own hands, and were finally placed out of the way for fear the men might injure themselves in attempting to make use of them. A hand pipe-cutter was more willingly used, as the hammer and chisel, or three-cornered file, their customary tools, were found more fatiguing, besides this new arrangement afforded more time for loafing. The new pipe vise was threatened with immediate demolition, as it deprived one man of his job. The affair they were using required two men to accomplish anything on it. The set of solid pipe dies with taper thread was received with mutters of disapprobation. One fellow sarcastically asked what would be done with the ball of hemp used to pack a poor thread or a loose joint. It is doubtless in the corner yet, for I did not see him make a meal of it as I requested. To renounce the straight thread with a few turns of hemp string to make it light, or admit that a copper wire calked around a coupling was ineffectual, seemed like treason. It was "always done just this way and it is quite good enough," they thought. Couldn't make the job last, you know!

The engineer or driver, with his wonderful ideas of belting, deserves a mention. Although this was out of my province, I

was interested in avoiding the frequent annoying stoppages caused by a belt constructed on false principles and laced by a doit. All suggestions were useless, and when I left he was using the same belt sewn with four strips of thick lace $\frac{1}{4}$ inch wide, which extended the entire length of the belt and kept it away from the pulleys. At the joint one end was lapped over the other and sewn through and through in a terrible and indiscriminate manner. Imagine a belt like this and the grand opportunity afforded for slipping or pulling apart.

The reason for all this seeming stupidity is readily seen in their profound reverence for ancient customs. It is born within them. To illustrate, the following is a conversation which I had with one of the individuals who stands at one of the many old iron gates which were formerly the entrances to public grounds or some old deserted palaces so common in London. He was stiff and important in a resplendent uniform covered with gold lace and trappings to a startling degree. "What are you standing here for, my friend?" said I. "Why, attending to my duty, of course," he replied. "But what are your duties?" "My duties? Why, I'm to stand here, sir! I've always stood here!" He is probably standing there yet, and will continue in his ornamental occupation as long as he lives, or until the gate rusts away in disgust at the stupidity of its guardian.

It would be unfair, indeed, to formulate opinions from so short an acquaintance, for there are very great exceptions to every experience. Small wages and narrow opportunities are difficult obstacles for any of us to surmount. Then let us be charitable and hope that the next four years of competition will prove to us a mutual benefit, and that the monkey wrench, not the hatchet, may be buried all over England, a convenient and fitting emblem of our good will. MACHINIST.

CHICAGO, December 15, 1892.

The Niagara Falls Power Scheme and American Turbines.

To the Editor: Accept my thanks for copy of *The Iron Age* with notice of annual meeting of the American Society Mechanical Engineers. Another article in same number which strikes me forcibly is the illustrated one on the development of the water power at Niagara Falls, with its huge vertical shafts. This method of conveying power has been practically obsolete in America since 1828, when Paul Moody and Samuel Batchelder adopted the system of main belts for the Appleton Mills at Lowell, and it seems like going backward to reproduce it at Niagara to-day. The writer has been familiar with turbines since his old friend, Uriah A. Boyden, introduced the Fourneyron turbine in Lowell in 1844, and has watched every step in their progress in this country up to the latest improved wheels of the present day, and he is surprised to see such a return to antiquated systems. If the consulting engineers, instead of going to Switzerland to examine their small mountain streams, had gone to New England and examined the plans recently adopted on the Merrimac and Androscoggin rivers, they would have found simpler, cheaper and more effective arrangements of turbines on horizontal shaft, in pairs, so as to neutralize end thrust, and driving mills direct from the wheel shaft by belts, under heads of from 30 to 50 feet, which would operate just as well under 150 feet head, if the castings of the wheels were of proper strength.

These later wheels are all solid bronze castings, and are set on shafts from 16 to 20 feet above tail water, so as to keep the belt pulleys dry, and using "draft tubes" to utilize the whole fall.

In the Niagara case, by cutting proper chambers in the rock, at the side of the tail race, and with the floor of them level with the top of it, sinking pits for the draft tubes, open on one side to the race and driving the dynamos in these chambers direct from the wheel shafts, the power would be carried up to the level above by the same wires which would be used to transmit it to Buffalo or elsewhere, and all shafting, gearing or belting avoided. I notice in the paper referred to that the Pelton Water Wheel Company propose this plan, but I see the names of none of the prominent American builders of turbines whose wheels in New England have almost superseded the more costly and less effective Fourneyson.

The writer is very sure that either Swain, Seffel, Risdon, the Holyoke Machine Company, Stilwell & Bierce, or the Dayton Globe Iron Works, could furnish plans and plants more simple, more effective and much cheaper, both in first cost and in economical results than the ship plans shown in your illustration.

As a specimen of what I mean I inclose a cut of the wheel pit of the Jefferson mills at Manchester, N. H., which, however, does not show the feeder-pipes from the canal, which are behind the wall.

If a pair of these little 43-inch Risdon wheels will give 800 horse-power under 48 feet head it is simple to calculate the power under 140 feet head, and the wheels only need to be proportionally stronger.

The writer first advised one pair of 60 inch wheels for this mill, but by the advice of the late Jas. B. Francis two pair of 43-inch wheels were substituted, as giving more perfect control of a variable quantity of water, and a higher velocity to the main shaft, which makes 225 revolutions per minute.

Under 140 feet head they would make about 386, which would be a fair speed for a large dynamo. The writer, who has probably tested more turbines than any one else in the United States with the exception of the tests made at the Holyoke flume, has attained net results of over 80 per cent. with all the wheels mentioned, and nearly 90 per cent. according to size, with some of them, and is only surprised that none of the above builders are mentioned in connection with this enterprise.

SAML. WEBBER.

CHARLESTOWN, N. H., December 17, 1892.

The Whiting Cupola.

To the Editor: We note in the edition of *The Iron Age* of December 8 that you speak of the Illinois Malleable Iron Company as having equipped their new foundry with a Colliau cupola of 20-ton melting capacity. We would say that this is evidently a mistake, as we supplied them with a No. 6 Whiting cupola for this foundry, and understand it is giving good satisfaction.

DETROIT FOUNDRY EQUIPMENT CO.

G. A. TRUE.

DETROIT, MICH., December 15, 1892.

The Buckeye Coke Company are located at Pioneer, Tenn., 50 miles north of Knoxville on the Knoxville & Ohio Railroad. R. Z. Roberts is president and R. M. Rhea vice-president; H. V. Hart, secretary and treasurer. The company operate a battery of 18 12-ton Thomas patent ovens, one 48-inch Ross disintegrator of 300 tons daily capacity. The ovens are 30 feet long, 12 feet wide and 6 feet high, inside measurement. The coal is crushed to uniform fineness—about that of meal—and thoroughly washed, thus removing all dirt, slate and other foreign substances, leaving only purest coal to go into the coke. The structure of coke is very strong and well adapted to the bearing of heaviest burdens. The company have used three crude

ovens in experimenting for the past two years, and coke made in these ovens, not crushed or washed, analyzed as low as 0.04 in sulphur, and very high in carbon. For foundry purposes the coke is doing all classes of work with satisfaction and for furnace work it is well adapted. It is expected that the capacity will be doubled early in 1893. The plant has been in operation about 30 days.

OBITUARY.

HOMER BOSTWICK.

Homer Bostwick died at Batavia, N. Y., December 8, aged 78 years. He was one of the town's oldest business men. He was born in Delaware County, N. Y., and went to Batavia in 1850. At first he settled on a farm, but soon moved to town and engaged in the hardware business, the firm being Bostwick & Kirkham. In 1860 the partnership was dissolved, and he became a coal dealer. Afterward he engaged in the insurance business.

RICHARD DENNE.

Richard Denne, aged about 50 years, of Seneca Falls, N. Y., died December 14, of heart disease. He was an Englishman by birth, but for the past 25 years had been Eastern agent of the Silsby Manufacturing Company of Seneca Falls.

HIRAM H. NIEMAN.

Hiram H. Nieman of Seneca Falls, N. Y., died in New York recently, where he had gone for medical treatment. The business interests of his town will miss him. He was born in Cincinnati, and went to Seneca Falls only a short time ago. For many years he was secretary of the Ahrens Fire Engine Company. He was active in promoting the success of the company, and when the consolidation of the several leading fire engine companies took place shortly more than a year ago, he was elected president of the American Fire Engine Company. While in active business he was stricken down with intestinal cancer, which caused his death.

JOHN T. KNIGHT.

The sudden death of John T. Knight took place at his home at Easton, Pa., December 15.

John T. Knight was born at East Thompson, Conn., in June, 1822, and consequently was in his seventy-first year when he died. His father, the late Elisha Knight, conducted a general store at East Thompson at that time. Later, however, the father, while John T. Knight was still very young, moved the family to Poughkeepsie, N. Y., where the deceased grew to manhood. Leaving Poughkeepsie, Mr. Knight was for a short time engaged as a clerk in New York City, and then with his brother, the late Samuel Knight, he came to Easton and engaged in the hardware and stove-top manufacturing business. When the Farmers' and Mechanics' Bank, now the First National Bank of Easton, was organized Mr. Knight was offered a clerkship, which he accepted. Later, when the Thomas Iron Company were organized, in 1854, Mr. Knight was elected as its secretary and treasurer, which positions he continued to hold until he was elected president of the company a couple of months ago to fill the vacancy occasioned by the death of Benjamin Clarke. For a time the now deceased continued as a clerk in the bank in connection with his duties with the Thomas Iron Company, but when the labor of the latter position grew too great for both positions to be filled by him he resigned his clerkship at the bank to devote his entire attention to the iron company. Mr. Knight was also actively connected with

other business and industrial interests. At the time of his death he was president of the Easton & Northern Railroad; president of the Edison Illuminating Company of Easton; president of the Easton Trust Company; and a director of the First National Bank of Easton, and of the Easton Transit Company.

The Steel Foundrymen.

A special meeting of the open-hearth steel foundrymen was held at the Manufacturers' Club, Philadelphia, Wednesday evening, December 7, 1892, in response to a letter which was sent out by Howard Evans, secretary of the Foundrymen's Association. He was requested to send this letter after conference with a number of steel foundries in that section. The purport of this letter was that prices for steel castings have been getting lower and lower during the past year, and open-hearth steel castings are being sold in the open market as low as 4½ and 5 cents per pound. A special meeting was held looking toward a plan which might bring about a better condition of things than exist at the present time. There were present at this meeting the following representatives of steel plants:

Thomas Howard, Shickle-Harrison & Howard Iron Company, St. Louis, Mo.
F. R. Phillips, Solid Steel Works, Alliance, O.

Benj. Atha, president Benj. Atha & Illingworth Company, Newark, N. J.
Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia.

W. C. Henderson, Thos. Devlin & Co., Philadelphia.

John Dickson, Penn Steel Casting & Machine Company, Chester.

W. B. Reaney, manager Eureka Cast Steel Company, Chester.

Daniel Eagan, general manager Sharon Steel Casting Company, Sharon, Pa.

J. H. Hampton, president Norristown Steel Company, Norristown, Pa.

Geo. J. Humbert, manager Norristown Steel Company, Norristown, Pa.

Fred. Frazer, president Syracuse Steel Foundry Company, Syracuse, N. Y.

Augustus Trump, secretary Pittsburgh Steel Casting Company, Pittsburgh.

Letters were received from the following:

Standard Steel Casting Company, Thurlow, Pa.

Isaac G. Johnson & Co., Spuyten Duyvil, New York City.

The Aschman Steel Casting Company, Sharon, Pa.

Chrome Steel Works, Brooklyn, N. Y.

Pratt & Letchworth, Buffalo, N. Y.

Midvale Steel Foundry, Nicetown, Pa.

Congdon Brake Shoe Company, Chicago, Ill.

Howard Evans was chosen chairman. After the letters had been read and expression of opinion had been received from those present, one thing was thoroughly settled, and that was that the present condition of the steel trade was in a very unsatisfactory state, and the prices at which steel castings were sold in the open market was entirely too low. The question then arose how to bring about a change for the better. The chair appointed the following committee:

Benj. Atha, president, chairman, Newark, N. J.

Daniel Eagan, manager, Sharon, Pa.

Geo. J. Humbert, manager, Norristown.

Augustus Trump, secretary and treasurer, Pittsburgh.

With power to add to this committee:

Robt. Wetherell, president Standard Steel Casting Company, Thurlow, Pa.

W. H. Bickley, president Penn Steel Casting Machine Company, Chester, Pa.

The purpose of appointing this committee was to devise a plan that might be acceptable to the steel men in the United States. From the fact that other organizations have failed by trying to make a card price, it is thought advisable that we refrain from doing so at this time, as it would be suicidal. There are many other questions to be solved that will redound to the interest of all. A price-list can only be made after a long deliberation, when there is more confidence existing between the different manufacturers than there is at present. Some one suggested that it might be possible to form a trust, another that a parent organization could be formed for selling the product of all the foundries, making a settlement every 30 days for castings, at about the actual cost, and at the expiration of about 60 days dividing the profit between the cost and selling price, according to the different capacity. It would seem possible that the steel men of the United States could make an arrangement for mutual protection that would be acceptable to all, for the reason that there are only about 20 open hearth steel plants.

After adjournment of this meeting a number of those present remained and talked the matter over socially, and expressed satisfaction at the number present, and at the effort made at this first meeting. Prominent operators stated that if some plan were not organized that would put a stop to the cutting of prices, it would only be a question of time when some of the open-hearth steel foundrymen would go to the wall. Another meeting of the steel founders will be held in Philadelphia early in January.

Standard Sizes of Bolts and Nuts.

The secretary of the American Railway Master Mechanics' Association has issued the following circular:

At the last annual convention of the American Railway Master Mechanics' Association a committee appointed for that purpose made a report on standard bolts and nuts, from which, and the discussion thereon, it appeared that the practice is still very common of making screw threads over their nominal size. For years different technical associations have been endeavoring to have a standard system of screw threads generally adopted in all railroad work. The importance of having all bolts and nuts of the same nominal size interchangeable would seem to be self-evident, and no argument ought to be required to convince those in authority over such matters of the great advantages which would result to railroad companies from such uniformity. At the risk of writing what is entirely obvious, it may be said here that bolts and nuts of the same nominal size in order to be interchangeable must—

1. Be of the same diameter. For this reason, in devising the United States standard system of screw threads, Mr. Sellers, its author, established $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 , $1\frac{1}{4}$ and $1\frac{1}{2}$ inches as the standard diameters up to that limit. There are no other sizes in the system except some larger than any of those given, which are not generally used in locomotive or car construction. There is no such thing, for example, as a U. S. standard screw $\frac{3}{4}$ and $\frac{3}{8}$ inch in diameter. Such a size is not recognized and has no existence in the system; and if any screws are made, as is often the case, $\frac{3}{8}$ or $\frac{1}{4}$ inch larger than the standard sizes, they cease to be standard. A nut accurately cut with a screw thread $\frac{3}{4}$ inch in diameter cannot be screwed on a bolt which is $\frac{3}{4}$ and $\frac{3}{8}$ inch in diameter. Over size, therefore, destroys interchangeability.

2. Screws and nuts of any given diame-

ter, to be interchangeable, must all have the same number of threads to an inch. This is provided for in the U. S. system. The following fractions represent the diameters of the screws, and the whole numbers the number of threads per inch: $\frac{1}{8}$ -20, $\frac{5}{16}$ -18, $\frac{3}{8}$ -16, $\frac{7}{16}$ -14, $\frac{1}{2}$ -13, $\frac{9}{16}$ -12; $\frac{3}{4}$ 11, $\frac{7}{8}$ -10, 1 -8, $1\frac{1}{8}$ -7, $1\frac{1}{4}$ -7.

3. The threads must be of a given form and proportion, which was determined when the system was devised.

4. The taps and dies with which the threads are cut on the bolts and nuts must be made so as to conform accurately to the conditions enumerated. To make such tools of a degree of precision which is required in order that bolts and nuts may fit each other accurately and at the same time be interchangeable, requires great skill and much experience and special machinery for the work. All of these have been provided by firms and companies which make a specialty of manufacturing such tools, so that buyers without proper facilities for doing that kind of work are much more certain to get accurate tools by buying them of some of the manufacturers than they will if they make them themselves.

The reason which is usually given for making bolts over size is that merchantable bar iron is usually much over size, and therefore the surplus material must be cut away by the screw-cutting dies unless the screws are made over size. Manufacturers are shrewd enough to know that they will sell more pounds of iron if it is made larger than its nominal size than they would if it was made of its true diameters, which accounts for the practice of making much iron which is sold in the market too large. Of course the surplus of material thus supplied must be paid for and is usually a dead loss to the purchaser.

In order to guard against the acceptance of over size iron double caliper limit gauges are now made for its inspection. One of the calipers is larger than the nominal size, and the other is smaller. In buying iron it is specified that it must enter the one gauge and must not enter the other. If the iron is too large or too small it will thus be detected at once on applying the gauges.

After hearing the report of its committee and a full discussion thereon, the Master Mechanics' Association adopted the following resolutions:

First, That this association commends and emphasizes the United States standard and urges upon all a rigid adherence to the same, and deprecates the use of over or under sized bolts and nuts, and urges all railroad officers to discontinue the use of screws which are not of standard size.

Second, That it is practicable to maintain the United States standard with the methods and gauges available.

Third, The committee recommends the adoption by the association of the United States standard for nuts based on rough size regardless of finished nuts.

Fourth, That the committee be instructed to prepare a circular calling attention to the importance of maintaining the standards of screw threads, and that the secretary send copies of this circular to all members, general superintendents, general managers and railroad newspapers.

A new process of making seamless copper ware, especially such as has to stand a very high pressure, is employed by the Springfield Brass Company of Springfield, Mass. The process so far has been employed on air chambers and floats and has proved to be successful. In former ways of depositing metal the product was of a crystallized, porous nature, and in trying to obtain a heavy shell it came out very rough, and lacked in tenacity, ductility and density. Therefore, the process could be used only on thin deposits such as elec-

trotyping or coating inferior or corrosive articles. In the new process the copper is acted upon by a heavy pressure during deposition, so that every thin film is treated separately. Comparative tests have been made by the leading pump and steam-trap manufacturers, and the result has been found to be in favor of the new article; under the old method floats or air chambers collapsing under 120 pounds pressure to the square inch, while under the new method they have stood 550 pounds pressure without injury. The Springfield Brass Company have a large plant for the economical manufacture of the aforesaid articles.

The Incandescent Lamp Case.

The United States Court of Appeals has granted the injunction asked for by the Edison General Electric Company against the Sawyer-Man Company (Westinghouse).

The injunction is a permanent one, forbidding the latter company to manufacture incandescent lamps infringing the Edison patent. The court imposes the condition that the Edison Company must sell lamps for use with Westinghouse apparatus installed prior to Judge Wallace's decision of July 14, 1891: "Upon terms reasonable under the circumstances of the particular case."

No provision whatever is made for supplying lamps to Westinghouse apparatus installed since July 14, 1891, or that may be hereafter installed, and the question of terms, prices, &c., for lamps for use with apparatus installed before that date is left open, except that they must be "reasonable under the circumstances of the particular case."

The history of the case, as given in the opinion of the court, is as follows:

For several years subsequent to 1880 the Edison Company and the United States Electric Lighting Company were the only manufacturers of incandescent lighting apparatus in this country doing any considerable business. The United States Electric Lighting Company began manufacturing incandescent lighting apparatus, including the lamps which have been held to be an infringement of the Edison patent, in the summer of 1880, and continued in such business until a recent period. In May, 1885, a suit was brought against it upon the present patent. Another corporation, the Consolidated Electric Lighting Company, was organized in September, 1882, and began the manufacture of incandescent lighting apparatus. This company was the owner of and operated under what are known as the Sawyer-Man patents for electric lighting apparatus; and under these patents it assumed that it had the exclusive right to make and sell the lamp claimed in the patent in suit. In May, 1885, suit was brought against it by the Edison Electric Light Company upon the patent in suit, and about the same time it brought suit against the Edison Company for infringement of its own patent. In 1883 a corporation known as the Thomson-Houston Company began the manufacture and sale of electric apparatus for lighting and power. As the result of negotiations between the Consolidated Electric Lighting Company and the Thomson-Houston Company the Sawyer-Man Company, the present defendant, was organized in September, 1886. Nine tenths of its stock was owned by the Thomson-Houston Company. It received from the Consolidated Company a license to manufacture lamps under the Sawyer-Man patents, and thereupon began the business of manufacturing the infringing lamp, and has continued in this business to the present time. In August, 1887, all the stock of the defendant, including that owned by

the Thomson-Houston Company, was sold to the Consolidated Company for \$120,000 in bonds, and the same amount at par of its stock. In December, 1888, the Thomson-Houston Company sold its stock in the Consolidated Company to the Westinghouse Electric Company. At the same time, by an agreement between the Consolidated Company and the Westinghouse Company, the fulfillment of which on the part of the Consolidated Company was guaranteed by the Westinghouse Company, the Thomson-Houston Company was licensed under the patents of the Consolidated Company to make incandescent lamps for export and use with generating apparatus of its own manufacture in this country; and the Westinghouse Company was prohibited from selling incandescent lamps for use with the Thomson-Houston generating apparatus for a period which might, at the option of the Thomson-Houston Company, extend to 1902. This agreement recognized the fact that the Thomson-Houston Company could during the continuance of the agreement make and sell lamps not covered by the Consolidated Company's patent; and in the event of such manufacture and sale the latter company was released from its obligation not to sell lamps for use in connection with the Thomson-Houston generating apparatus. Pending the suit against the United States Electric Light Company, the Westinghouse Company succeeded to the business of the United States Company, the Consolidated Company and the defendant; and since September, 1888, the defendant has been the manufacturer of lamps for the Westinghouse system. Each of the various companies engaged in the manufacture and sale of electric lighting apparatus has, as a rule, manufactured all the different pieces of apparatus which are necessary for making up a complete "plant," the different parts being constructed with reference to use with each other, and not so as to be adapted for use in the systems of apparatus made by other manufacturers. For the purpose of public lighting from central stations local companies, known as illuminating companies, have been organized in various cities and towns, which have purchased plants from one or the other of the manufacturing companies, and the central stations of such illuminating companies have, as a rule, been equipped wholly with the electrical apparatus made by some one manufacturing company. In many cities and towns there are competing illuminating companies using the system of different manufacturers, some being equipped with the Edison system, some with the Westinghouse system, and some with the Thomson-Houston system.

The United States Company have installed about 1050 plants, with a lamp capacity of about 350,000 lamps. About 300 of these plants were installed before the suit upon the patent was brought against it. The Consolidated Company also installed a large number of plants. After the Westinghouse Company succeeded to the business of the United States Company and the Consolidated Company they also installed a large number of plants.

It is said that the aggregate lamp capacity of the incandescent lighting plants installed with generating apparatus supplied by the Westinghouse Company at the present time represents a capital of about \$25,000,000, and a lamp capacity of over 1,300,000 lamps. The lamps themselves represent but a small part of the cost of the plants, the greater part being represented by the electric apparatus supplied by the Westinghouse Company and its predecessors, but the lamps are essential for the continued operation of the plants. Unless the lamps can be replaced as they are worn out, and can be procured when needed, these plants will be crippled and

the greater part of the investment in them will be lost. The central station plants supply lights to consumers as gas companies supply gas, and if their operation should be stopped great inconvenience to the public would ensue. The various companies give employment to a large number of men who might be thrown out of employment if the lamps could not be obtained.

In 1889 the Edison General Electric Company was organized for the purpose of combining the Edison Electric Light Company with various other corporations engaged in the manufacture and sale of electric apparatus, the organization of the subordinate corporations being retained. Prior to April, 1892, the Thomson-Houston Company had acquired the stocks of various other companies engaged in the business of manufacturing and selling electrical apparatus, and these companies were carrying on the business in combination with the Thomson-Houston Company and under its control. In April, 1892, these two combinations, the Edison General Electric Company and the Thomson-Houston Electric Company, included substantially all the companies which had theretofore been competing in this kind of business, excepting the Westinghouse Company, and in that month the General Electric Company was organized for the purpose of combining these two combinations in one which should include all the concerns in this country except the Westinghouse Company, which formerly were competing in the business of making and selling electric light and power apparatus, but the separate organization of the constituent companies was still retained.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 20, 1892.

The Chiefs of the Bureaus of Construction and Steam Engineering have not yet completed their examination of the proposals for Cruiser No. 3 and battle ship to see that they conform to the Department plans and that there are no entangling provisions inserted.

The following figures from the official abstract show the amounts of the different bids:

Cruiser No. 3, 8000 Tons.

	Class 1.	Class 2.
Newport News Co., Va.....	\$3,147,000	
Union Iron Works, San Francisco.....	3,050,000	
Bath Iron Works, Maine.....	3,165,000	
Cramps, Philadelphia.....	2,983,000	a. \$3,086,000 b. 2,880,000

Battle Ship, 9000 Tons.

	Class 1.	Class 2.
Newport News Co., Va.....	\$3,233,000	
Union Iron Works, San Francisco.....	3,150,000	
Bath Iron Works, Maine.....	3,185,000	
Cramp & Sons, Philadelphia.....	3,010,000	a. 3,110,000 b. 2,870,000

All the bids were straight on the Department plans except the Bath Company for the battle ship.

The Cramps submitted three bids, one straight, and A and B or using the Department hulls and contractors' engines.

It can be stated that the awards will be in accordance with the Department plans.

It has not yet been determined whether one or both vessels shall be built on the Atlantic side of the continent.

The Cramps are the lowest bidders on both vessels, but a potential Pacific Slope influence is at work to secure one of the ships for the other side. Mr. Irving Scott is still here looking after the interests of the Pacific Coast works. The difference in the bids between San Francisco and Philadelphia is but \$64,000 in favor of the latter for the cruiser and \$140,000 for the battle ship.

It will be some days before the Bureau will be ready to submit their reports as to the conformity of the bids and plans and specifications. The Secretary of the Navy will then decide as to the award.

MANUFACTURING.

Iron and Steel.

It is reported that a number of business men of McKeesport, Pa., are in correspondence with a large iron and steel firm located in the East, with a view of inducing the concern to locate in McKeesport. It is stated that representatives of the firm have recently visited McKeesport and made a very favorable report on a site for the plant, located 2 miles above McKeesport, on the Monongahela River.

Rosena Furnace, at New Castle, Pa., now owned by the Oliver Iron & Steel Company of Pittsburgh and operated under the name of the Rosena Furnace Company, will be extensively repaired and improved preparatory to being put in blast. New hot-blast stoves and blowing engines will be added, and it is expected that about \$100,000 will be expended in improvements to the plant.

It is announced that a 10 per cent. reduction has been made in the wages of employees of the Phoenixville Iron Company, at Phoenixville, Pa., with the exception of the puddlers, whose wages have been reduced from \$3.25 to \$3 per ton.

The blast furnace department and the Bessemer steel department of the plant of the Bellaire Nail Works at Bellaire, Ohio, have been making some good records recently for production. The blast furnace in question has a 16-foot bosh and is 75 feet in height, and made in one day recently 278 tons of No. 1 Bessemer iron. During the month of November the Bessemer plant turned out 10,418 tons of ingots. The blast furnace and steel plant have been in constant operation for some months past, but the steel plant will be closed down for about ten days at the close of the year for the purpose of making the usual annual repairs.

The scales of wages at the Bessemer plant of the Wheeling Steel & Iron Company and the Riverside Iron Works, both of Wheeling, W. Va., will expire on January 1, and the work of preparing new scales has been going on for some time past. It is intimated that the new scales will be on a somewhat lower basis than the present ones, in order to allow these concerns to compete with other plants where lower rates of wages have been in force since July 1 last.

The Cleveland Rolling Mill Company of Cleveland, Ohio, who are creditors to the extent of \$17,000, brought action in United States Circuit Court at Chicago in conjunction with the Illinois Steel Company, who are creditors to the extent of \$170,000, to set aside judgment confessed by the bankrupt Joliet Enterprise Company in favor of Fish & Sons, bankers. The action is based on the claim that the company confessed judgment to their own officers.

It is announced that the differences between the heaters in the plate mill of the Pottstown Iron Company, at Pottstown, Pa., and the firm, have been adjusted to the satisfaction of all concerned, and under the arrangement made heaters will be paid 18 cents per ton and helpers 11 cents per ton.

Crumwold Furnace, at Emaus, Pa., formerly known as Emaus Furnace, which has been idle for a number of years, was put in operation last week.

The scrap furnace at the Albany Iron Works, Troy, N. Y., which has been idle for a week, has been lighted again.

The Bessemer Steel Works, at Troy, N. Y., will close about January 1 and remain idle about six weeks on account of lack of orders.

The McCosh Iron & Steel Works, at Burlington, Iowa, were sold by the sheriff on the 15th inst. and were bid in for \$75,000 by Starker and Remy, trustees of the banks holding mortgages for \$220,000 on which foreclosure was made.

Marked improvement is reported in the output of the Pueblo steel works of the Colorado Fuel & Steel Company, recently remodeled under the direction of E. C. Potter, formerly of the Illinois Steel Company. In the steel rail department a notable gain is recorded, the 24 hours' run now footing up nearly 325 tons. The improvements extend over the entire plant, placing the works in a far better condition than ever before. At the present time the works are in active operation throughout to meet the demand for rails and pig iron.

The Edgar Thomson Steel Works of the Carnegie Steel Company, Limited, at Bessemer, Pa., will be closed down during this week for about ten days for the purpose of making the usual annual repairs. Operations will be resumed

on rails as soon as these repairs have been completed. The report that the straighteners employed at the above plant had made a new scale of wages for 1893 is without foundation. Last December a scale of wages governing all departments of the Edgar Thomson Steel Works was formulated, and this scale does not expire until December 31, 1894.

The Riverside Iron Works of Wheeling, W. Va., have under construction a 21-inch three-high skelp mill with three stands of rolls. It is the fourth mill of the same size in the plant besides two smaller skelp mills, and is expected to be ready for operation some time during February next.

It is stated that the sale of the property of the Keystone Iron Works Company of Kansas City, Mo., to satisfy an attachment of \$64,000 held by the Carnegie Steel Company, Limited, of Pittsburgh, has been postponed to March 1, 1893.

Mount Vernon Furnace, at Campbell Post Office, Ohio, has blown out for repairs. Operations will be resumed about February 1.

Four large boilers in the Newport Rolling Mill, at Newport, Ky., exploded, killing two men and badly wrecking the mill. The loss is placed at \$15,000.

The Henderson Steel Works, at Birmingham, Ala., have been placed in working order and improvements added, and will be operated by the Jefferson Steel Company, recently organized.

The forge department of the United States Car Company, at Anniston, Ala., has been started up to fill an order for axles.

Warwick Furnace at Pottstown, Pa., recently made its largest output in one week, producing 954 tons. The furnace was blown in a short time ago.

The furnace of the Pottstown Iron Company, at Pottstown, Pa., has blown out for the purpose of making repairs. Operations will be resumed as soon as the necessary improvements have been made. The furnace had been in blast for over two and a half years.

It is announced that the Sterling Steel Company of Pittsburgh have been awarded a large contract by the Government for Wheeler armor-piercing projectiles. This contract was awarded after severe competitive tests with the famous Holtzer shells of France and the American production of the Firminy shell of England. It is stated that the Wheeler shell made by the Sterling Steel Company can be fired again after once striking and penetrating the armor plate, something impossible in projectiles heretofore made.

Machinery.

The plants of the Buffalo Brass Company and National Car Wheel Works at Depew, N. Y., are practically completed and will probably soon begin operations. The Palmer Spring Gear Works are to locate there, as the company have purchased 5 acres of land adjoining that of the car wheel works.

Three new boilers are being placed in the gun foundry of the Watervliet, N. Y., Arsenal. The new Corliss engine is almost completed, and will be ready for use in a few days. Three carloads of machinery from the Pond Tool Company have arrived and is being put up as rapidly as possible. Three turning and finishing lathes and four turning and boring lathes are completed.

Another influx of orders has forced the Reeves Pulley Company of Columbus, Ind., to add a night force, and their factory is now running to its utmost capacity 20 hours per day.

It is stated that the Westinghouse Electric & Mfg. Company of Pittsburgh will have sufficient capacity to manufacture and supply all of the new electric lamps that will be needed in their business, and that there will be very little interruption of any kind in the operations of the company as a result of the decision rendered last week in the action brought by the Edison Electric Light Company.

A deed of voluntary assignment for the benefit of the creditors of C. V. Sheriff, doing business as the Sheriff Machinery Company, dealers in engines and machinery of all kinds, located at 80 Water street, Pittsburgh, Pa., to W. M. Lindsay, was filed for record in the courts of Pittsburgh last week. All of the assignor's property, including the warehouse and store at 80 Water street and the machine and repair shop at 49 Water street, is assigned.

The Henry Johnson Foundry Company, 176 South Clinton street, Chicago, announce that they are prepared to tin gray-iron castings and will sell shop, county and State rights for a new patented process for tin-plating castings. The inventor claims that his process will enable iron castings of any description to be readily tinned. Samples exhibited by the company, which are taken from regular goods

to be shipped to customers, present a very handsome appearance, being thoroughly coated.

The officers of the Howe Scale Company, Rutland, Vt., are preparing for their annual inventory. The works will be shut down two weeks for that purpose.

Dobbie & Stewart, of Portage street, Niagara Falls, N. Y., have completed their new iron foundry and will soon begin business.

The Goulds Mfg. Company, Seneca Falls, N. Y., have just completed one of their largest triplex pumps for the grounds of the World's Fair. It weighs 8 tons.

The Coldwell-Wilcox Mfg. Company of Newburg, N. Y., have sent to the island of Cuba a large piece of machinery, a set of double gearing, to be used in a sugar cane mill. The machinery weighed 50 tons. It consisted of a bed plate weighing 14 tons, two large wheel and two pinions. The bed plate was made in sections, and contains the largest single casting in the machine, weighing 6 tons. The larger wheel weighs 18 tons, is 15 feet in diameter, has 21-inch face and 6 inch pitch. The pinion that runs in the larger wheel weighs 3½ tons. The company have been very busy the past summer. More than 75 per cent. of their manufactures are sent outside the United States. Another large order has just been received from a Cuban firm. The company now have 100 men, every portion of the plant is in use, and new tools have been added recently.

The Buffalo, N. Y., railroad shops have never been busier than they are at present. All are working full time. The heavy summer freight traffic and preparations for the World's Fair force them to their fullest extent. Every car available is being put in the best condition. The Wagner car shops at East Buffalo usually employ 1600 men, but now have 1800 and will increase that number. The New York Central machine and car shops are rushed with repairs and rebuilding. The changing of freight cars to air brakes and automatic couplers causes much extra work. The Erie machine shops at East Buffalo are busy with general repairs. The force has been largely increased. The Lackawanna shops are working on full time. The tracks are full of locomotives to be repaired. The Lake Shore shops tell the same story, new cars are also being built there. The Western New York and Pennsylvania shops are rebuilding and repairing as rapidly as possible. General repairs are going on at the Reading shops, East Buffalo. The same can be said of the Nickel Plate shops at the Abbott Road, and the Buffalo, Rochester & Pittsburgh at Buffalo Creek. The Buffalo Car Mfg. Company, the Gould Coupler Company, Pratt & Letchworth, Farrar, Trefts & Rood, the Buffalo Car Wheel Works, Rood & Brown's Car Wheel Works and the New York Car Wheel Works are kept running full force. The malleable iron works of Farrar, Trefts & Rood, at East Buffalo, where all of the castings for the Erie Railroad are now made, have been so crowded for room that a large addition has been made to the foundry.

The Totten & Hogg Iron and Steel Foundry Company of Pittsburgh, Pa., in addition to manufacturing rolling mill machinery, have recently taken up the manufacture of roll lathes.

The Niagara Car Wheel Company of Buffalo, N. Y., have purchased property on which a building 700 x 300 feet will be erected.

The boiler works of Isaac Pott & Co., at Lebanon, Pa., will be operated by a company recently organized with a capital of \$75,000.

From Roanoke, Va., comes the announcement that the Roanoke Machine Works are to be enlarged.

Fitzgerald Brothers' new machine shop at Port Huron, Mich., has been completed.

The Cooley & Vater Company of Minneapolis have been incorporated, with a capital of \$50,000, for the manufacture of engines, boilers and electrical goods.

The Denver & Rio Grande roundhouse and machine shop at Salida, Col., have been destroyed by fire, together with 17 locomotives and much valuable machinery. The loss is estimated at \$300,000, partially covered by insurance. The burned structures will probably be rebuilt on a larger scale.

Park, Brother & Co., Limited, of the Black Diamond Steel Works, Pittsburgh, Pa., recently turned out 16 copper plates, 30 x 9 feet in size, weighing 4500 pounds each. These plates are to be placed on a ship to protect the steel from corrosion.

The business of the St. Paul Plow Company, whose plant at Gladstone, near St. Paul, Minn., was recently burned, is to be removed to Spokane, Wash. The burned works cost \$200,000 and the plant to be erected at Spokane will cost, it is stated, \$400,000.

The Janesville Improvement Company have been formed at Janesville, Wis., with a capital of \$100,000, for the purpose of forming new enterprises for that place.

The wide range of the trade which N. P. Bowsher of South Bend, Ind., has built up is shown by recent shipments of his balancing way which have been made to D. E. Evans & Co., electrical manufacturers, 16 South Gay street, Baltimore; to J. A. Fay & Co., the well-known machinery manufacturers of Cincinnati; to the General Electric Company of Schenectady, N. Y., who now have two in use; to the Ball Electric Lighting Company, 404 West Twenty-seventh street, New York, and to the J. H. & D. Lake Company, makers of friction clutch pulleys, at Hornellsville, N. Y.

The entire plant of the Fort Scott Foundry & Machine Works, established at Fort Scott, Kan., in 1869, and owned by the Walburn-Swenson Company, is now being removed to their new works at Chicago Heights, Cook County, Ill. The general offices will be in the Monadnock Block, Chicago. The new plant is twice the size of the old one, and with the new and improved machinery the capacity will be more than doubled. The large trade which the company have built up in the Eastern and Middle States, and also for export, made it desirable for them to seek a more central location. The Eastern office of the company is at 31 and 33 Broadway, New York.

The Enterprise Boiler Company of Youngstown, Ohio, have recently added to their equipment a 5-ton traveling crane.

Miscellaneous.

At a meeting of the Board of Directors of the Philadelphia Natural Gas Company, held in Pittsburgh last week, the quarterly dividend of 1½ per cent. was declared, payable to stockholders of record December 31. This is an increase of ¼ per cent. placing the stock on a 5 per cent. basis, which is said to be extremely gratifying to the stockholders.

The plant of the Shenango Natural Gas Company, at New Castle, Pa., was recently sold at sheriff sale to T. Mellon & Sons, bankers, of Pittsburgh, for \$52,000. At the time of the sale there was a judgment of \$8000 against the company in favor of Chas. Manni, an employee who was injured in a gas explosion at Ellwood, Pa. On the afternoon of the 14th inst. a petition was filed at court to confirm the sale and authorize the execution of a title to the purchasers. This was done under an act of Assembly which permits a purchaser holding a first lien to become the purchaser finally.

The Ensign Mfg. Company of Huntington, W. Va., have the following orders on hand: For the Cleveland, Akron & Columbus Railway Company, 325 30-ton plain gondola cars; for the Chesapeake & Ohio Railway Company 750 30-ton hopper bottom gondola coal cars, and 250 30-ton box cars, both classes of cars to have Janney couplers and Westinghouse air brakes.

The new Pittsburgh Coal Company of Columbus, Ohio, have contracted with the Jeffrey Mfg. Company of the same place, for a second plant of their coal mining machines. The new Pittsburgh company have used the Jeffrey mining machines for over eight years. The above order is for an electric plant.

Negotiations are on foot looking to the removal to Ravenna, Ohio, of A. C. Williams' foundry and sad iron establishment, recently burned out at Chagrin Falls, Ohio. It is understood that the Board of Improvements at Ravenna agreed to donate a free site and buildings in order to secure this industry. About 200 men will be given employment when operations are commenced.

The Abram Cox Stove Company have recently installed in their factory at Lansdale, Pa., two new dynamos of large type for nickel plating. These dynamos were furnished by the Zucker & Levett Chemical Company of New York City.

The Union Mfg. Company, with a capital stock of \$25,000, have been organized at New Philadelphia, Ohio, for the purpose of manufacturing and dealing in metal roofings, sidings, ceilings and cornice work. The incorporators are: Albert G. Reeves, Daniel B. Ludwick, A. S. Knisely, E. A. Deardorff and Robert H. McCleary.

The Roberts Tinware Company, with a capital stock of \$25,000, have been organized at Cleveland, Ohio, for the purpose of manufacturing and dealing in all forms and kinds of tin goods, and goods made from all kinds of sheet metal. The incorporators are: Jno. W. Roberts, Ben Patterson, Frank B. Stevens, R. C. Hopkins and Alton C. Dustin.

The Hudson River Ore & Iron Company of Burden Station, Columbia County, N. Y., have declared a dividend of 2 per cent. The last dividend was given in June.

TRADE REPORT.

The approach of the holidays, coupled as it is with the closing down of a large number of plants for repairs, has made all the markets exceedingly dull.

Generally speaking, the declining tendency in raw materials and finished goods has gained further headway, lower prices having been accepted whenever any business has been done to seriously test the market. There is a good deal of uneasiness concerning the future, because buyers have all the advantage now and are likely to avail themselves of it when the time for contracting for larger quantities of material comes.

Pig Iron is very quiet and weaker in the leading primary markets, Chicago alone enjoying a more cheerful vein. Pittsburgh notes lower prices on Bessemer Pig, and has reports of transactions at an even lower level.

Steel Billets are unsettled in eastern and western Pennsylvania. Buyers in some cases have withdrawn from the market, convinced, apparently, that there is profit in biding their time.

In Steel Rails, the principal event of the week has been the sale of 10,000 tons of foreign Rails for the Pacific Coast, Seattle delivery. The result of the meeting of the manufacturers yesterday has not yet been announced. While under the agreement prices are not fixed by the association, it is rumored that a slightly lower quotation is soon likely to become general. From the West come reports that buying will soon begin. Two large lines are now in the market for about 35,000 tons.

Along the whole line of Finished Iron and Steel new business has been very scarce and what little work does come up is fought over fiercely. Buyers are being drummed as never before, so that they have become very cautious and are withdrawing any orders which must not be immediately filled.

Copper drags along. The November statistics which we publish elsewhere are favorable on the whole. Tin has dropped to 18.40¢ and there is a diversion of supplies from this market to England. Lead has recovered a little from its lowest level and is now selling at 3.80¢, while Spelter continues dull. In Tin Plates there has been a fair business in light weight cokes.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., December 20, 1892.

The near approach of the holidays is not favorable for the development of business in Iron or Steel, and it begins to look as though trading for the year is pretty well over. There is some inquiry for material, and as everybody knows, contracts of very considerable importance are almost ready to be placed, but nothing definite has been accomplished beyond the preliminary movements. Meanwhile work at many of the leading mills is pretty nearly completed, so that there is considerable anxiety to replace it with something new. It is too soon to estimate with much certainty under what conditions the mills will start up after the holidays, but from present appearances work for immediate delivery will not be abundant. A large proportion of the deliveries on contracts now pending will have to extend over the whole of 1893, and for the first month or two requirements are not expected to be large, which is equivalent to saying that prices will be extremely low. At this writing it can be said, without fear of contradiction, that prices are already very close to the lowest on record, yet buyers are perfectly indifferent and indicate by their actions that they are satisfied to take their chances awhile longer. There is no possibility of anything more than fractional declines, but the discouraging feature is the apathy with which all inducements are received.

These remarks apply not only to Finished Material, but to everything on the list, and from present appearances the year is likely to close without very much of a reaction, notwithstanding the vast amount of work that is almost ready for distribution.

Pig Iron.—The market is weaker. In many respects the situation is fairly encouraging, but within the past few days there has been a decided change of front among holders. Until recently the feeling was distinctly opposed to concessions. Many good concerns took the ground that lower prices were out of the question; they might blow out their furnaces, but lower prices were impossible. Recently, however, there has been a willingness to shade a few cents on good-sized lots, but as good-sized lots were not called for the shading was done on such lots as buyers were willing to take, and, averaging the market all around, it is pretty certain that it is about 25¢ lower, and at that there are no very marked indications of a desire to place large orders. As a matter of fact, the chief characteristic of the situation is the absolute indifference of buyers. They are not desirous of seeing lower prices; they are sure that prices won't advance, the practical outcome of which is—that they do nothing. The pressure to realize is not of an alarming character by any means, makers simply want to keep things moving; 100-ton lots, 50-ton lots, carload lots, anything to make sure that they are in the swim, and that their trade is not going elsewhere. Dullness at this season, however, is only what might be expected, and, while the deeper the rut that things get into the harder it will be to get them out, there is really nothing unforeseen in the situation, but in the meantime the effect is depressing in the extreme. Of course there must be a change soon; stocks in consumers' yards are at the lowest point possible, and while it is hardly likely that very large lots will be taken, the rapid demand for small lots is sure to bring a reaction in due time. For the present, however, the demand is very languid at about the following prices for Philadelphia and nearby deliveries, and at 25¢ to 50¢ less for Southern brands, delivered at

points 100 miles or thereabouts West or South:

American Scotch, No. 1x.....	\$17.00	@	\$17.25
American Scotch, No. 2x.....	16.00	@	16.25
Standard Penna. (Lake Ore), No. 1x.....	15.00	@	15.50
Standard Penna. (Lake Ore), No. 2x.....	14.25	@	14.50
Standard Penna. (Lake Ore), No. 3 plain.....	13.50	@	13.75
Medium Quality, No. 1x.....	14.50	@	14.75
Medium Quality, No. 2x.....	14.00	@	14.25
Standard Virginia, No. 1x.....	14.75	@	15.00
Standard Virginia, No. 2x.....	14.00	@	14.50
Virginia and Southern, No. 1x.....	Soft.....		
Virginia and Southern, No. 2x.....	Soft.....		
Standard Penna. and Virginia.....	13.25	@	13.50
Forge.....	12.75	@	13.00
Ordinary Forge.....	12.75	@	13.00

Bessemer and Low Phosphorus Iron.—The feeling is a trifle easier, but business appears to be done at pretty close to \$16 at furnace for standard Bessemer, and \$17.75 for strictly gilt-edged Low-Phosphorus. Several lots have been taken during the week, and although consumers strive hard for concessions, it is not easy to gain more than a few cents per ton, even on large lots.

Steel Billets.—The market is very unsettled, and prices almost as much a mystery as ever. It is easy enough to get a quotation, but the difficulty is to make a quotation that will bring business and be reasonably satisfactory to both buyer and seller. That, indeed, is hardly likely to occur at present, as the buyer's price will certainly not suit the seller, although it may be necessary to accept it in order to start business. Asking prices, however, are from \$24.25 @ \$24.50 Schuylkill Valley, and about 50¢ less for the Susquehanna, but buyers are in no hurry to make bids, although a few orders for January and February could probably be had at a concession of 40¢ to 50¢. So far as known nothing beyond a few small lots have been taken for immediate shipment at a price somewhat better than asked for later dates.

Muck Bars.—No business doing, although there are free offerings at \$24 @ \$24 25, delivered.

Bars.—Business is extremely slow, and while prices are not quotably lower, it probably only requires the right kind of a bid to make a new price. City mills quote 1.65¢ @ 1.70¢; interior mills, 1.60¢ @ 1.65¢, but sales have been made at these figures by some of the last mentioned—freight prepaid—and, as we said before, it only requires a reasonably decent bid for buyers to get what they want at their own price. It is just possible that the suspension of work during the holidays may help to adjust things a little, but the outlook is far from encouraging, and extremely low prices seem to be inevitable for some time to come.

Plates.—Nothing of importance has been closed and most of the business mentioned during the past two or three weeks is still in abeyance. The greater portion of it, however, is certain to be closed in the near future, and although at low figures, it will be something to start on, which at present is what every one seems anxious to secure, as most of the leading mills are very close to the end of their old orders. Small orders are still coming forward in good style, the idea being to get supplied before the mills shut down for the Christmas holidays. General quotations are about as follows, although on large orders desirable as to specification and time for delivery, slight concessions could probably be had.

	Iron.		Steel.
Tank Plates.....	1.80 @ 1.90¢	1.85	@ 1.90¢
Shell.....		2.10	@ 2.20¢
Flange.....	2.70 @ 2.90¢	2.40	@ 2.50¢
Fire Box.....	3.00 @ 4.00¢	2.60	@ 2.70¢
Special qualities.....		3.25	@ 3.75¢

Structural Material.—There is nothing specially new in this line, and while the mills have a moderate amount of work in hand, specifications come rather slowly and orders that can be conveniently sandwiched in between are taken at extremely low figures. The general outlook is considered good, although the unsettled financial situation may affect some projects unfavorably, and cause unexpected delays and disappointments. General quotations are about as follows: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.85¢ @ 1.95¢; Universal Plates, 1.9¢ @ 1.95¢.

Sheets.—There is very little business at present, and mills are mostly running on stock to tide over the holidays. Prices are weak, but for best makes are quoted as follows:

Best Refined, Nos. 14 to 20.....2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26.....3.15¢ @ 3.20¢
Best Refined, No. 27.....3.30¢ @ 3.40¢
Best Refined, No. 28.....3.40¢ @ 3.50¢
Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than are here named:

Best Soft Steel, Nos. 14 to 16.....2½¢ @ 2½¢
Best Soft Steel, Nos. 18 to 20.....3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24.....3½¢ @ 3½¢
Best Soft Steel, Nos. 25 to 26.....3½¢ @ 3½¢
Best Soft Steel, Nos. 27 to 28.....3½¢ @ 4¢
Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount....70 and 5 %

Old Material.—There is some inquiry for deliveries after the holidays, but bids are about 50¢ below what holders feel able to accept, asking prices being about as follows: Old Iron Rails, \$18 @ \$19, delivered; Old Street Rails, \$19 @ \$20; Old Steel Rails, \$15 @ \$16; No. 1 Railroad Scrap, \$16 @ \$16.50, Philadelphia, or for deliveries at mills in the interior, \$16.50 @ \$17.50, according to distance and quality; \$8 @ \$9 for No. 2 Light; \$11 @ \$12 for Machinery Scrap; \$11 @ \$12 for Wrought Turnings; \$8 for Cast Borings, and nominally \$20 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

Wrought-Iron Pipe.—Demand very slow, but prices are steady and unchanged, with discounts as follows, subject to the regular jobbers' commission: Butt, Black, 55 %; Butt, Galvanized, 47½ %; Lap, Black, 65 %; Lap, Galvanized, 55 %; Boiler Tubes, 65 % all sizes new list; Casing, 62½ % new list.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, }
CHICAGO, December 21, 1892. }
(By Telegraph.)

Much complaint is heard among all classes of business men regarding the irregularity in local railroad service. The terminal facilities of the railroads here are seriously overtaxed. Cars are detained two to three weeks on the way to central depots from the outside yards. Many merchants who distribute from their own warehouses claim that their business is much lighter than it would be if they could receive their goods more promptly. The business of Chicago has increased so rapidly within the past year that railroads have been unable to keep pace with it. The difficulty, therefore, is something which cannot be remedied immediately, but calls for extensive changes, which must be undertaken at once in order to meet present necessities as well as to provide for the continued growth which seems well assured for the future.

Pig Iron.—The most encouraging feature to report is that shipments on contracts are unusually heavy for this time of the year. Ordinarily as the end of the year approaches consumers ask to have deliveries deferred while they shut down for repairs or for the holidays, but now they are running steadily to keep up with the

demands upon them. This argues well for the future. As long as consumption keeps up at this pace manufacturers are hopeful for a good demand for what they have to sell. Although immediate sales are light, a great deal of business is in prospect, which may, however, not be entered before the end of the year. The business in hand consists of small lots, on which sharp delivery is urged by the buyers. Prices of Coke Iron show no material change from those reported last week, but concessions are still being made by representatives of the smaller Southern companies. Lake Superior Charcoal is quiet but firm. Considerable inquiry is reported, covering an aggregate of several thousand tons. It is expected that January will see quite a number of these deals closed, from present appearances. The statistical situation shows continued improvement. The stock of Lake Superior Charcoal on hand at the furnaces on July 1 was 131,000 tons and on December 1 was 176,000 tons. The present stock is more than covered by contracts which have been made, so that furnace companies will enter the new year with much better prospects than they had a year ago. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$16.50 @ \$17.00
Local Coke Foundry, No. 1.....	13.75 @ 14.25
Local Coke Foundry, No. 2.....	13.50 @ 14.00
Local Coke Foundry, No. 3.....	13.25 @ 13.75
Local Scotch.....	14.25 @ 14.75
Ohio Strong Softeners.....	16.25 @ 17.00
Southern Coke, No. 1.....	14.75 @ 15.25
Southern Coke, No. 2.....	13.60 @ 14.00
Southern Coke, No. 3.....	13.10 @ 13.25
Southern, No. 1, Soft.....	13.60 @ 14.00
Southern, No. 2, Soft.....	13.00 @ 13.25
Southern Gray Forge.....	12.85 @ 13.10
Southern Mottled.....	12.50 @ 12.75
Tennessee Charcoal, No. 1.....	16.50 @ 17.50
Alabama Car Wheel.....	19.50 @ 20.50
Coke Bessemer.....	14.50 @ 15.00
Hocking Valley, No. 1.....	17.00 @ 17.50
Jackson County Silvery.....	17.00 @ 17.50

Bars.—The orders for Bar Iron placed during the past week have been mainly for car work, some good-sized contracts having been closed but at somewhat lower figures than those previously current. The general demand is now running to small lots. Very few large concerns can be found that have not covered all their possible requirements considerably into the new year. The valley mills are holding firmly at 1.65¢, Chicago, on straight Bar orders, but greater concessions are being made on specifications carrying high extras. Under the circumstances it is impossible to make one price which will represent the exact condition of the market. The local mills are understood to be making quotations on the same basis. Soft Steel Bars are unchanged at 1.70¢ @ 1.75¢, Chicago, from mill. Jobbers continue to quote Bar Iron and Soft Steel in small lots at 1.80¢ @ 1.90¢.

Structural Iron.—The Metropolitan Elevated contract which was placed last week covers some 5000 tons of material, which will be erected at the lowest price ever named on similar work in the West. The order is said to be merely a beginning of the very extensive construction to be undertaken by the Metropolitan Company, and is only a small part of what they will eventually require. This seems to be a good time for the erection of elevated roads, and it is probable that other projects which have been hanging for a long time may soon be put in hand. The demand for small lots of Beams and other Structural Material is fairly active, and local yards have not yet caught up with their orders. Large contracts, however, are not in shape to be placed, but every day adds to the number which will come up both in this city and outside for the coming season, which promises to be a heavy one. Quotations continue as follows for mill lots, Chicago delivery: Beams, 2.25¢ @ 2.30¢; Angles, 1.90¢ @ 2¢; Universal and Sheared Plates, 1.95¢ @ 2.10¢. Small lots from stock are selling at 10¢ @ 20¢ @ 100 advance on these figures.

Plates.—A great deal of business is being done by dealers, the demand being confined to small lots from stock. Mill orders are decidedly scarce, although it is stated that large buyers would place orders if they could obtain somewhat lower prices from mills than those now quoted. The refusal of the manufacturers to entertain such offers would indicate that values are now down to rock bottom. Reports are received here that some important mills will be shut down rather than reduce prices still more. Stocks are very low in warehouses here and also in consumers' hands. The effects of the strike last spring are still felt in this way. Prices for mill shipment, Chicago delivery, are as follows: Tank Steel, 2¢ @ 2.10¢; Shell Steel, 2.12½¢ @ 2.25¢; Flange Steel, 2.25¢ @ 2.75¢, according to make. Quotations from stock are as follows: Tank Steel, 2.30¢ @ 2.50¢; Sheet Steel, 2.50¢ @ 2.60¢; Flange Steel, 2.75¢ @ 3¢; Iron Sheets, Nos. 10 to 14 gauge, 2.45¢ @ 2.60¢; Steel Sheets, Nos. 10 to 14 gauge, 2.50¢ @ 2.75¢. Boiler Tubes, 65 % discount. The price agreed to by manufacturers is not now being strictly maintained on large orders for Tubes.

Sheets.—The past week has witnessed a slack demand for Black Sheets. Representatives of mills are now looking forward to a season of comparative dullness, except on specialties, as well as very light Sheets for certain classes of work, for which the demand, though spasmodic, is better than during the corresponding season of other years. Common Black Sheets, for mill shipment, Chicago delivery, are quoted as follows: Nos. 18 to 21, 2.65¢; Nos. 21 to 24, 2.75¢; Nos. 25 and 26, 2.85¢; No. 27, 2.95¢. Soft Steel Sheets command a slight advance on these figures, according to the mill. Galvanized Sheets are running about as they did last week, with, perhaps, a little abatement in the demand. Stocks in warehouses continue very small. Carload lots are still quoted at 70 and 7½ % discount for Juniata, but this price is shaded on good specifications. Small lots are quoted at 70 % off. Sheet Copper is holding up very well, and the month promises to be one of the best ever known in this market. Small lots are still quoted at 30 % discount.

Merchant Steel.—A healthy condition of trade is reported in cheap Steels. The manufacturers of standard grades are driven to their utmost capacity on regular contracts and the only pressure for business comes from those who are not recognized as having the same standing. Inquiries are now being received on considerable quantities for next year's delivery from consumers who do not usually anticipate their requirements so far ahead. Mill shipments, Chicago delivery, are quoted as follows: Open-hearth Machinery, 2¢ @ 2.15¢; Spring Steel, 1.90¢ @ 2.15¢; Tire Steel, 1.90¢ @ 2¢; ordinary Tool Steel, 6¼¢ and upward, according to quality. The quotations given for Tire Steel refer to high-grade Steel and by the best mills. Mild Tire Steel is offered at lower rates, as usual.

Billets and Rods.—The market is very quiet in this line, with hardly an inquiry being received for either. The Joliet mill will shut down very shortly not to resume until extensive repairs are made, which will perhaps cover two or three months. Under the circumstances no quotations can be made here.

Rails and Track Supplies.—A few small orders for standard Rails have been received, but the business of the year is now practically closed. Indications are growing stronger that the large Western companies will at an early date negotiate for their requirements for the coming year. On this subject nothing definite has trans-

pired. Iron and Steel Splice Bars are somewhat lower and may now be quoted at 1.65¢ @ 1.75¢; Track Bolts with Hexagon Nuts, 2.60¢ @ 2.70¢; Spikes, 2.05¢ @ 2.10.

Old Rails and Wheels.—Some business is reported in Old Iron Rails, sales having been made of about 1500 tons at \$18.75, Chicago or in the immediate vicinity. Dealers are holding large lots on which they expect to get higher prices later. Old Steel Rails continue to be quoted at \$12.75 @ \$15, according to length. Actual sales of Old Car Wheels have been made during the week at \$14.75 @ \$15. These are the first transactions which have come to light for a long time.

Scrap.—The only matter of interest in the market is the prospective buying by a local mill to be started in January; otherwise the market for Wrought is very dull. Cast continues in fair demand. We continue former quotations, with the remark they may vary 50¢ per ton up or down, according to the conditions of the sale.

Metals.—Lake Copper is slightly lower and may now be quoted 12½¢ for carload lots, the decline being due more to light demand than to any other cause. Casting brands are unchanged at 11½¢. Spelter is weaker and quoted now 4.15¢ @ 4.20¢. Sales of some 200 tons of Pig Lead are reported at 3.55¢.

Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, December 20, 1892.

Undoubtedly the event of the week was the awarding of a contract for Structural Material to the Carnegie Steel Company, Limited, of this city, to be used in the construction of the West Side Elevated Railroad in Chicago. Much of the material will be turned out at the Keystone Bridge Works in this city. Nothing has been given out regarding prices, but it is understood competition was very severe. This is the second large contract for Chicago elevated work taken by the Carnegie concern within a year, the first one having been secured early in this year, and amounted to about 15,000 tons. Nothing of interest relating to the Iron and Steel trades occurred during the week under review. Buying of all kinds of material is almost at a standstill, and as one dealer puts it, "nobody wants anything at any price." No improvement in either demand or prices is looked for until after the first of the year. Advices continue to indicate that stocks in the hands of consumers are pretty low, and a heavy demand for nearly all kinds of material is looked for in 1893. It is confidently expected that consumption next year will eclipse any previous year in the history of the Iron and Steel trades.

Pig Iron.—The week under review was an extremely quiet one as regards sales, and buyers and sellers alike have settled down to the conviction that there will be no business done until after the first of the year. Prices of course are weak, and the market continues to be disturbed by reports of very low prices being offered buyers for Iron for delivery next year. If it is true that such offers have been made, it is evident that some furnacemen have very little confidence in the immediate future of the market. It is the impression, however, that any attempts to force sales at this time would be a mistake, for the reason that buyers do not want Iron just now, and it would require very tempting prices to induce them to enter the market. It is believed that the situation will improve after the first of the year, as it is known that several large consumers of both Bessemer and Gray Forge have very

little Iron on hand, and must replenish their stocks before long. Bessemer continues to rule at about \$13.75, f.o.b. cars Pittsburgh, and Gray Forge is barely holding its own at \$12.50, with large offerings and very little changing hands. A good order for Gray Forge put on the market at this time would doubtless shade the above price. We quote as follows:

Neutral Gray Forge.....	\$12.50, cash.
All-Ore Mill.....	\$12.50 @ 12.75, "
No. 1 Foundry.....	14.00 @ 14.10, "
No. 2 Foundry.....	13.00 @ 13.10, "
Charcoal Foundry No. 1.....	19.00 @ 19.50, "
Charcoal Foundry No. 2.....	19.50 @ 20.00, "
Bessemer Iron.....	13.65 @ 13.75, "

While we do not quote Bessemer Iron below \$13.65, Pittsburgh, reports are going that this price has been shaded to some extent where there were some unusual conditions existing.

Steel Rails.—During this week the Edgar Thomson plant will be closed down for about ten days for the usual annual repairs. Operations will be resumed on Rails after the first of the year. It is reported that the Pennsylvania Railroad Company have decided to add two additional tracks to their roadbed between Pittsburgh and Altoona, a distance of 117 miles, making four tracks in all. Work on this improvement will be commenced early in spring. There has been no improvement in the demand for Rails, although Edgar Thomson is understood to have sufficient orders to insure operations for some little time.

Structural Material.—During last week the 28 inch mill, the 33-inch mill and the Bessemer department of the Homestead plant were closed down for repairs. Some extensive improvements and additions to machinery will be made in these three departments, and in order that this work may be done in the shortest possible time, one-half of the men employed in these mills will be kept at work. The volume of business in Structural Material continues small, and orders are nearly altogether for very small lots. No improvement in demand is expected until the severe winter weather is over. Competition continues severe, and prices are easier than a week ago. We quote as follows: Beams and Channels, in small lots, 2¢ @ 2.10¢; Angles, 1.70¢ @ 1.90¢; Universal Mill Plates, 1.70¢ @ 1.80¢; Z Bars, 1.90¢, and Tees, 2.10¢ @ 2.20¢.

Ferromanganese.—The market is very quiet, and very little material is moving. Prices have declined and we now quote 80 % domestic at \$61.50, f.o.b. at mill.

Bessemer Billets.—Last week was an exceedingly quiet one, no transactions of any magnitude being made. It is reported here on good authority that one large buyer is in the market for about 12,000 tons for the second quarter of 1893, and has been feeling the market during the past week in order to get an idea of prices. Makers and dealers alike agree that just as soon as buyers become convinced that it is safe to buy a large tonnage in Billets will change hands, as it is known absolutely that three or four concerns are in position to buy if so disposed. Present indications, however, do not favor any material movement in demand for some little time yet, for the reason that prices continue weak in the almost utter absence of business, and in all probability will go still lower. At the Riverside and Wheeling plants new scales of wages are now being prepared to go in force on January 1, next. The Bellaire plant made during November 10,418 tons of Finished Steel, and this plant will probably close down the first week in January for the purpose of making some repairs. The Newcastle plant, the last in the field, is working in a highly satisfactory manner, and is turning out between 600 and 700

tons of Billets every 24 hours. As compared with last week prices are lower, and just what quotation would fairly represent the market is difficult to say, for the reason that no large orders have been placed recently with one exception. For small lots ranging from 500 to 1000 tons as high as \$22.50 at maker's mill is being obtained in some cases, and we are advised of one sale of 750 tons for delivery in the first three months of next year at a slightly higher price than the above, and also 500 tons for the same delivery at a price about equal to \$22.50 at maker's mill.

Muck Bars.—The first transaction in Muck Bars of which we have been advised for three or four weeks past was one of 500 tons made last week. The cheap price of Soft Steel will probably prevent any improvement in the demand for Muck Bars, as many concerns have given up the rolling of Iron altogether and are using Steel exclusively. No. 1 Muck Bars may be quoted nominally at \$24.25 at buyer's mill in the absence of sales.

Steel Plates.—Elsewhere in this issue we refer to the large order taken by the Carnegie concern for material for the West Side Elevated Road in Chicago. The demand for Plates continues good, but much of the business is being taken by two or three concerns in this city who have exceptional facilities for the production of material at the smallest possible cost. The severe competition for business has resulted in some very low prices being made, and, as will be noticed, we have slightly reduced prices this week. It is intimated that should prices go any lower those concerns who have not the best equipment will be compelled to close down temporarily or market their product at little or no profit. As far as the future is concerned, we are advised that there is considerable business in sight and general activity among the mills may be expected for some time to come. We quote the market as follows: Bridge Plates, 1.90¢ @ 2¢; Flange, 2¢ @ 2.05¢; Fire Box, 3.40¢ @ 3.45¢; Tank, 1.65¢ @ 1.70¢; Shell, 1.95¢ @ 2.15¢. For several large orders recently placed these prices have been shaded to some extent.

Wire Rods.—The market continues very dull, with little or no prospects for any improvement in demand in the near future. One concern here advises us that they have made a few sales for next year's delivery at fairly satisfactory prices. We quote Wire Rods on a basis of \$30.50, f.o.b. Pittsburgh. For a good sized order this price would no doubt be shaded.

Sheets.—The manufacturers of Iron and Steel Sheets who attended the meeting held in this city last week reported that the demand has shown the usual falling off which invariably comes at this season of the year, but were a unit in saying that prospects for next year's business were very encouraging. Prices ruling are low, but with an improved demand slightly higher figures are confidently expected. We quote No. 24 at 2.65¢ @ 2.70¢; No. 26 at 2.75¢ @ 2.80¢ and No. 27 at 2.75¢ @ 2.80¢. Soft Steel Sheets bring from 5¢ to 10¢ per 100 pounds better than the above prices.

Merchant Steel.—As we approach the close of the year some buyers have commenced to look around for next year's supply, and as a consequence inquiries were more numerous during the past week. While new business coming in for some time past has been very limited in amount, the mills continue in full operation on old orders. Prices do not show any change over our quotations of last week, and we quote Open Hearth Spring and Machinery at 1.95¢ @ 2¢; Tire Steel, 1.85¢ @ 2¢; and Sleigh Shoe, flat bars, 2¢; and Tool Steel from 6¢ upward.

Skelp Iron.—The demand has fallen off considerably, due to the decreased demand for Pipe and Tubes which invariably comes at this season of the year. Prices, too, have weakened to some extent and we now quote Grooved Skelp at 1.55¢ @ 1.60¢ and Sheared at 1.75¢ @ 1.80¢, with the usual 2% discount for cash.

Merchant Bars.—The market continues very dull and with no prospects of an increased demand until after the first of the year. A number of mills have pretty well cleaned up their old business, and, unless they are fortunate enough to book a good many orders between now and the first of the year, it is altogether probable that a number of concerns will start up on single turn after repairs have been completed. In some cases it is stated that, on account of the dull condition of the market, a number of concerns will close down for a longer period than was intended for the purpose of making needed repairs. As we have before stated, however, there are several mills in this vicinity that are pretty well fixed for business for next year, and will resume operations again just as soon as possible after repairs have been completed. We continue to quote City made Bars of best grades at 1.60¢ @ 1.65¢, while in some cases 1.70¢ is being obtained. The claim is made that mills in the Mahoning Valley are still well fixed with orders, and are not making special efforts to capture new business on account of the extremely low prices that have been made in a good many cases. Bars in the Mahoning Valley are held firmly at 1.50¢ and it is not believed this price would be shaded except for a specially desirable order.

Wire and Cut Nails.—The demand continues very small, and many of the mills are now running nearly altogether on stock. Improvement in demand is expected after the first of the year, as at that time a number of buyers generally enter the market to lay in their supplies for spring trade. We continue to quote Wire Nails at \$1.45 in carload lots on a 35¢ average, but this price continues to be shaded where good sized lots are involved. Jobbers continue to get from \$1.50 to \$1.55 from small dealers in less than carload lots. The demand for Cut Nails at this season is next to nothing, and it is not believed there will be any improvement for some little time yet. Several mills in the Wheeling district have solicited large buyers recently for specifications, but so far as we are advised no large orders have been placed for some time. We continue to quote Cut Nails at \$1.45 on a 30¢ average, f.o.b. in Wheeling district. It is the impression that this price would be shaded 2½¢ if a desirable order were involved.

Barb Wire.—As we noted last week, a few concerns have come into the market for their spring stock, and this has served to relieve somewhat the monotony of the situation as regards Wire. Nearly all the material now being turned out, however, is for stock in anticipation of a spring trade movement setting in during January or early in February. Several makers advise us that the outlook for the consumption of both Plain and Barb Wire for next year was never better, and it is believed that consumption in 1893 will be even larger than this year, which, as is well known, was extremely heavy. We quote Painted Barb Wire at \$2 in carload lots, and Galvanized at \$2.40; for less than carload lots a slight advance on these prices is obtained.

Scrap Iron and Steel.—The market is absolutely lifeless, and in the face of existing conditions it is almost impossible to quote prices that will be correct. When a buyer enters the market for a good-sized lot of Scrap he is in many cases able to purchase at almost his own figures. Stocks

continue large, and while a better demand is expected after the mills get in operation again in January it is the general belief that stocks are too large to permit any material advance in prices taking place. We continue to quote No. 1 Railroad Wrought Scrap at \$15 @ \$15.25 ¢ net ton; Cast-Iron Borings we quote at \$7.50 ¢ gross ton; and Wrought-Iron Turnings at \$10 @ \$10.50 ¢ net ton; Leaf and Coil Springs are extremely quiet, and \$19 could probably be obtained for the former and about \$17 for the latter. There is no demand for old Iron Axles, and these may be quoted nominally at \$20 ¢ net ton.

Old Rails.—The situation in the Scrap Iron and Steel trades reflects in a large measure the condition of the Old Rail market. Occasionally a small lot of Rails changes hands, but, where there is one buyer in the market, he is confronted with at least have a dozen sellers. In this condition of affairs, it is absolutely impossible to correctly name prices, and we omit quotations for this week.

Cincinnati.

Office of The Iron Age, Fourth and Main Sts.,
CINCINNATI, December 21, 1892.

(By Telegraph.)

We have still to report a light volume of business in Pig Iron, the transactions during the past week being confined to the current consumptive wants of the trade, and nothing better is expected until after the turn of the year. There are numerous applications to have deliveries on contracts delayed until next month so that stocks will not appear in the invoicing on January 1, but there are also some contracts for January on which the Iron is desired now. The stronger furnaces and Iron companies maintain a firm front and will not entertain any proposition for concessions, but it is a fact that there are some other furnaces open to offers, and it is rumored that some transactions have taken place at concessions. Some Northern Irons have successfully competed with Southern Iron in the more Northerly markets, but that has not made much impression here. They are able to do this because of the freight rate, which is \$2.75 ¢ ton from Birmingham to this city, and from other points in the South it is 25¢ @ 30¢ ¢ ton less. It is not expected that any change will be made the coming January, although if Pig Iron was higher that would undoubtedly cause an advance in freight. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$13.75 @	\$14.00
Southern Coke, No. 2.....	12.50 @	12.75
Southern Coke, No. 3.....	12.00 @	12.25
Ohio Soft Stone Coal, No. 1.....	16.00 @	16.50
Ohio Soft Stone Coal, No. 2.....	15.00 @	15.50
Mahoning and Shenango Valley.....	15.75 @	16.75
Hanging Rock Charcoal, No. 1....	19.15 @	19.50
Hanging Rock Charcoal, No. 2....	18.00 @	19.00
Tennessee and Alabama Charcoal, No. 1.....	16.50 @	17.00
Tennessee and Alabama Charcoal, No. 2.....	15.50 @	16.00

Forge.

Gray Forge.....	11.50 @	11.75
Mottled Neutral Coke.....	11.25 @	11.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	18.75 @	19.00
Lake Superior Car Wheel and Malleable.....	17.75 @	18.00

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., under date of December 19, writes: A little more activity has been experienced in Finished Material and some good orders have been placed, but prices are a shade lower than they were a month ago. The Pig Iron market is without any new features, and very little trade, except carload lots,

is in sight. A few inquiries for round lots have been received, but in most cases the buyers are only sounding the market, and unless some concessions are made will not result in any very large buying. We report a dull market, and no change in prices:

Lake Superior Charcoal, all numbers.....	\$17.00 @	\$17.50
Lake Superior Coke, Bessemer.....	16.00 @	16.50
Lake Superior Coke, Foundry.....	16.00 @	17.00
all ore.....	16.50 @	17.00
Standard Ohio Blackband (40 per cent.).....	14.50 @	15.00
Southern No. 1.....	12.50 @	13.00
Southern Gray Forge.....	17.75 @	18.25
Jackson County (Ohio) Silvery.....		

Cleveland.

CLEVELAND, OHIO, December 19, 1892.

Iron Ore.—Notwithstanding the presence of the holiday season considerable Ore is being sold to consumers in the valleys, who are anxious to complete their stocks early in the new year. Buying is, of course, confined to small lots, but the aggregate amount of business done is quite large. Prices are unchanged and buyers have the advantage of a large supply of unsold Ore on the docks to pick their supplies from. Red Hematites, Bessemer quality, assaying as high as 63 per cent. in iron, and, being very low in phosphorus, can be had at figures very close to \$4, f.o.b. cars Cleveland. The call from the furnaces is still quite pronounced, over 34,000 tons having been sent forward during the past week as compared with 33,000 tons for the corresponding week in 1891. Some talk regarding next season's quotations is heard about the Iron Ore offices, but nothing has been done in the way of establishing prices. It would not be surprising, however, if considerable Ore to be mined in 1893 should be placed very early next year.

Pig Iron.—Bessemer Irons have again weakened, and we hear of a sale of 500 tons at \$14. Forge Irons are fairly firm at \$12.60, Cleveland delivery. No reason is assigned for the slump in Bessemer unless it is the general apathy incidental to the holidays. The reports of decreasing stocks from month to month would naturally be expected to add strength to the market, and dealers believe that the present exhibition of weakness is only temporary. Sellers are not at all anxious to hurry sales, being quite contented to await the developments of the new year. Not much business is looked for until the holidays are over. Quotations are as follows, the figures for Bessemer being reduced:

Nos. 1 to 6 Lake Superior Charcoal.....	\$17.00
Nos. 1, 2 and 3 Bessemer, per ton.....	\$13.75 @ 14.00
No. 1 Strong Foundry, per ton.....	14.50 @ 14.75
No. 2 Strong Foundry, per ton.....	13.50 @ 13.75
No. 1 American Scotch, per ton.....	14.50 @ 14.75
No. 2 American Scotch, per ton.....	13.50 @ 13.75
No. 1 Soft Silvery, per ton.....	14.50 @ 15.00
Mahoning and Shenango Valley Neutral Mill Irons, per ton.....	12.50 @ 13.00
Mahoning and Shenango Valley Red Short Mills, per ton.....	13.00 @ 13.25

Old Rails.—The market drags a little, although quotations for Old Americans are still announced at \$19.50 @ \$20.

Bar Iron.—The demand continues brisk and the mills are well supplied with orders at 1.60¢ @ 1.65¢ for deliveries extending well into next year.

Scrap.—The market is very dull, as may be imagined from these quotations: No. 1 Railroad Wrought, \$15; Cast Scrap, \$11; Wrought Turnings, \$10.

Nails.—Only a small amount of business is being done at unchanged prices. Wire Nails are quoted at \$1.55 @ \$1.60, and Cut Nails at \$1.60 @ \$1.65 in stock.

Barb Wire.—The outlook for a good season is excellent and many inquiries are already coming in.

St. Louis.

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, December 19, 1892.

Pig Iron.—The week under review has been a quiet one in many respects, sales, as a rule, running from carload lots up to 100 and 200 ton lots. Consumers are buying in limited quantities, as they do not care to carry over into next year too much in the way of raw material. The strong Southern furnaces refuse to make concessions, so far as prices are concerned. There are, however, a number of Southern concerns who are willing to shade prices to secure business. This shading of prices, while it is done in a semi-private manner, soon becomes public property, and the general market feels the result. At this writing it is difficult to see anything in the situation to warrant the belief that prices will shortly improve, notwithstanding the fact that statistically the market is stronger than it has been for some months. The actual condition of the market is such, however, that lower prices seem more or less of a certainty. The balance of the year will not show much in the way of business, and sales during January and the early part of February are not likely to be heavy. In the meantime a steady production is in progress, which is a menace to any advance. The prudent consumer will buy as his needs require, and thus be in a position to take advantage of any radical movement which may advance or depress prices. For ordinary quantities we quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry...	\$14.25 @ \$14.50
Southern Coke, No. 2 Foundry...	13.00 @ 13.25
Southern Coke, No. 3 Foundry...	12.50 @ 12.75
Gray Forge.....	12.00 @ 12.25
Southern Charcoal, No. 1 Foundry.....	15.75 @ 16.25
Southern Charcoal, No. 2 Foundry.....	15.25 @ 15.50
Missouri Charcoal, No. 1 Foundry.....	14.50 @ 14.75
Missouri Charcoal, No. 2 Foundry.....	14.00 @ 14.25
Ohio Softeners.....	16.50 @ 16.75
Southern Car Wheel.....	18.25 @ 18.50

Bar Iron.—Mills are not quite so busy as last reported, but prices remain unchanged. Jobbers, however, report a very steady trade for the month of December, and state the present demand is unusual for this period of the year. Judging from the present outlook jobbers will have their hands full well up to the close of the year. We quote as follows: Lots from mill command from 1.60¢ to 1.62½¢, half extras, f.o.b. cars East St. Louis. Jobbers ask 1.70¢ @ 1.75¢ from store, according to quantity.

Barb Wire.—Trade in this department continues in a fairly satisfactory condition. Large quantities of Wire are being shipped to Texas points, which offer an inducement just now in the shape of a low freight rate. Outside of this demand trade is only fair and prices are not quite so steady as last reported. We quote as follows: Painted from mill, \$2.15 @ \$2.20; Galvanized, \$2.60 @ \$2.65.

Wire Nails.—The demand for Wire Nails shows a decided falling off and prices are weaker in consequence. Mills quote \$1.65, f.o.b. cars here, which is shaded on large quantities—say about 5¢ per keg. Trade is expected to improve shortly and manufacturers anticipate a strong market as soon as the spring trade makes its appearance.

(By Telegraph.)

Pig Lead.—There is practically no change to make in this metal, either as regards prices or volume of business. Sales are limited at 3.50¢, with free offerings of future shipments at that price, but with little business resulting therefrom.

Spelter.—The market continues without change at 4.10¢. A few sales are reported at a trifle lower than this figure, but for ordinary quantities 4.10¢ is the prevailing price. The future does not apparently hold anything in the way of encouragement for any advance.

A. P. DeCamp & Co., St. Louis, Mo., with offices in the Continental Building have been appointed exclusive agents for the sale of Sloss Iron, made by the Sloss Iron & Steel Company, Birmingham, Ala. They have also secured the exclusive agency for the Elk Rapids Iron Company, Elk Rapids, Mich., whose product is Lake Superior Charcoal Iron.

Louisville.

LOUISVILLE, KY., December 19, 1892.

That general quietness should exist at this season is accepted by both makers and consumers of Iron as natural. Manufacturers are all busy, and are not apprehensive of the demand falling off after the first of the year. Furnaces are well sold up for the first three or four months of 1893, and the large producers are not disposed to push sales and be forced to accept lower than ruling prices, when they know there will be a demand for their Iron at the proper time. Notwithstanding the short car supply, the condition of stocks shows a large reduction for November, and until the policy of the incoming administration is somewhat more definitely decided there will be no blowing in of additional furnaces. The indications, therefore, are for a gradual reduction of stocks for some time to come. We quote for cash, f.o. b. cars Louisville:

Southern Coke, No. 1 Foundry...	\$13.25 @ \$13.50
Southern Coke, No. 2 Foundry...	12.00 @ 12.25
Southern Coke, No. 3 Foundry...	11.50 @ 11.75
Southern Coke, Gray Forge....	11.25 @ 11.50
Southern Charcoal, No. 1 Foundry	15.00 @ 16.00
Southern Car Wheel.....	17.50 @ 17.75

New York.

Office of The Iron Age, 96-102 Reade street,
NEW YORK, December 21, 1892.

Pig Iron.—Sellers are showing more anxiety to place their product, the Northern furnaces apparently taking the lead in this movement. The principal Southern companies are still firm, while the smaller concerns are naming lower prices. We quote Northern brands at \$15 @ \$15.50 for No. 1; \$14 @ \$14.50 for No. 2; \$13 @ \$13.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.75 @ \$15 for No. 1; \$13.75 @ \$14 for No. 2 and No. 1 Soft; \$13.25 @ \$13.50 for No. 2 Soft; \$12.75 @ \$13 for Gray Forge.

Ferromanganese.—Only small lots for immediate delivery are called for. We quote \$60 @ \$60.50 for 80% foreign Ferro.

Billets and Rods.—One large buyer who has been in the market has withdrawn, and similarly, negotiations on a lot of foreign Rods are off for the present. We quote Steel Billets, tidewater, \$24.50 @ \$25; foreign, \$29.50 @ \$30; Wire Rods, \$33.25 @ \$33.50; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$54.50 @ \$56.

Steel Rails.—Eastern mills report sales aggregating about 3500 tons. The principal event of the week has been the announcement that a lot of 10,000 tons of English Rails has been taken for delivery at Seattle, Wash. The Steel Rail manufacturers held a meeting yesterday, the outcome of which has not yet been announced.

Manufactured Iron and Steel.—Only a very moderate amount of current business is being done, and in Structural Ma-

terial the outlook for the immediate future is not particularly bright, because we are now entering the dullest season of the year for architectural work. We quote Beams at 2.25¢ @ 2.75¢ for small lots and 2¢ @ 2.25¢ for round lots, according to sizes; Angles, 1.85¢ @ 2¢; Sheared Plates, 1.85¢ @ 2.10¢; Tees, 2.10¢ @ 2.30¢; Channels, 2.10¢ @ 2.20¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.85¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.5¢ @ 2.75¢ for Marine, and 2.60¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.65¢ @ 1.9¢, on dock; Common, 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.90¢ @ 2.1¢, and Links and Pins, 2¢ @ 2.20¢; Steel Hoops, 1.90¢ @ 2¢, delivered.

Track Material.—We quote Spikes, 1.90¢ @ 2¢; Fish Plates, 1.60¢ @ 1.65¢; Track Bolts, square nuts, 2.40¢ @ 2.60¢, and hexagon nuts, 2.70¢ @ 2.80¢, delivered.

Metal Market.

Copper.—The movement in this metal has been very slow, and the market is bare of distinctly new feature. That supply continues ample for the demand is evidenced in the fact that so-called outside lots are still within reach at prices slightly below those supposed to be adhered to by the leading producers. Still no pressure to sell is manifested, although home consumers are very indifferent about placing orders for future delivery and export outlets supplied in a good measure by prior shipments. Bids of 12½¢ for Lake Superior Ingot are still made without leading to business. Small parcels offered at 12.30¢ have, on the other hand, found few takers. The popular asking prices are 12½¢ @ 12½¢. Casting Copper is quoted at 11½¢ for round lots and 11¼¢ @ 11½¢ for small jobbing quantities. Arizona Pig is nominally 10½¢ @ 10½¢, with little or nothing doing at the moment.

The monthly production of Copper in the United States since July has been as follows, the first column giving the aggregate return from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

	Reporting mines. Gross tons.	Outside sources. Gross tons.	Total. Gross tons.
July.....	9,294	924	10,218
August....	10,807	870	11,677
September..	9,710	994	10,704
October....	9,668	1,239	10,907
November..	9,888	1,096	10,984

Obviously the closing down of the Anaconda in the middle of the month has not told very greatly on the product. It should, however, reduce the December total to about 7000 to 7500 gross tons.

The exports from the United States in fine Copper for November were 3897 gross tons.

The principal producers of the Peninsula, Germany, the Cape, Australia, Venezuela and Mexico report monthly to London. Their estimated product before this system of reporting was instituted was 7087 gross tons monthly. The actual product as reported has been:

	Gross tons.
July.....	6,358
August.....	6,888
September....	5,478
October.....	6,476
November.....	6,789

This shows that the foreign mines are 3446 gross tons behind the estimated production, in five months.

Pig Tin.—There has been a further drop in the price of Straits Tin and the market has presented an appearance of depression suggestive of pressure to realize and more or less "bear" manipulation.

On the decline, a considerable amount of old speculative accounts was closed out, December and January deliveries in particular. A fairly large quantity of Metal was taken for consumption and out-of-town trade account, but new speculative deals figure with no prominence. Of spot stock sales have been made at from 19.60¢ down to 19.40¢. Current month delivery went at the same figures and the margin between the latter and January delivery was practically wiped out. Early in the week about 100 tons or more were purchased for shipment to England, for delivery on contracts, and since then, it is asserted, some Tin afloat originally intended for America has been diverted to that quarter.

Pig Lead.—The signs of improvement in the market that came to the front at about the time of writing last week's review have assumed more definite form and the tone is now quite firm, with 3.80¢ bid and 3.85¢ upward asked. On the turn a very good business was effected, chiefly at 3½¢ @ 3.80¢, but the demand has slackened somewhat during the past few days and is only fair at the present time.

Spelter.—Western brands in carload lots are still quoted at 4½¢ @ 4.40¢, but the market remains in a stupid sort of condition. Buyers in various quarters apparently incline to hold back pending developments in connection with a rumored reduction in freight rates next month. Aside from that the market is unfavorably affected by heavy production.

Antimony.—With supply liberal and competition rather keen, prices still lean more or less in buyers' favor. Current quotations are 10½¢ @ 10½¢ for Hallett's, 11¢ @ 11½¢ for LX, 11¢ @ 11½¢ for Crown and 11½¢ for Cookson's in round lots.

Tin Plate.—For future delivery there has been a very fair business in 100 lb and lighter weight Bessemer Cokes, chiefly at prices a shade below those at which sales were made last week and at 5¢ @ 7½¢ discount from spot prices. Otherwise merely routine jobbing sales of moderate proportions and the spot demand continue slow. Quotations are reduced to a moderate extent in some few instances, and the general market is characterized by rather weak tone. We quote spot prices as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, \$5.50; light weights, \$5.12½ for 100 lb, \$5.00 for 95-lb, \$4.90 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.80 @ \$6.85. IC Charcoals—Melyn grade, ½ X assortment, \$6.40; Crosses, \$8; Allaway grade, any assortment, \$5.70; Crosses, \$7; Grange grade, any assortment, \$5.80; Crosses, \$7.15. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.75; do., 20 x 28, \$15.50; Dean, 14 x 20, \$5.40; do., 20 x 28, scarce; D. R. D. grade, 14 x 20, \$5.30; do., 20 x 28, \$10.50; Alyn, 14 x 20, \$5.35; do., 20 x 28, \$10.60; Dyffryn, 14 x 20, \$5.50; do., 20 x 28, scarce. Wasters—S. T. P. grade, 14 x 20, \$5.10; do., 20 x 28, \$9.90; Abercarne grade, 14 x 20, \$5; do., 20 x 28, \$9.80.

The Pardee estate interest in the Minersville, Pa., Iron Works has been transferred, it is understood, to the Philadelphia & Reading Company, who will turn the establishment into a car repair shop to relieve the immense strain on the shops at Reading, Schuylkill Haven and Palo Alto.

The Carpenter Steel Company of Reading, Pa., have just received a large order for projectiles.

Financial.

Events in Wall street culminated in more than usual activity and excitement growing out of large shipments of gold, and a collapse in industrial stocks leading to a calling in of loans for which such stocks were held as collateral and much disturbance generally. But there was no panic. Gold engagements amounted to near \$4,000,000, and further shipments were spoken of to meet payments by railroads of interest due in Europe January 1. The close scrutiny of collaterals and discrimination against industrials advanced rates as high as 40 % at one time, but later money was offered in large amounts. Secretary Foster expressed confidence that gold exports could cause no serious embarrassment to the Treasury, but it was intimated that he might soon confer with bankers respecting the situation. The acknowledged failure of the Brussels Monetary Conference gives more immediate interest to the question of silver coinage. Pending some definite settlement the banks are more inclined to strengthen their gold reserves.

The stock market was mainly affected by gold shipments and discrimination against these-called industrials as collateral for loans. On Friday there were important declines in Whisky and Lead, Sugar and Chicago Gas following in sympathy. On Saturday the market opened a little stronger, and one feature was a rise in New England on the announcement that the Boston & Maine had obtained control of the Connecticut River Road, and another feature was an improvement in Whisky and in Sugar, but soon after there was an attack upon Whisky, which had an unsettling effect upon the whole list. On Monday the market was unsettled and lower. Chicago Gas was especially affected by reports that the old pool will not be reorganized, and Whisky broke down on news of the establishment of more opposition distilleries in the West. There was also a break in Reading. The weak feeling in the exchange market and the fact that rates are now below the gold shipping point, indicating that after Wednesday no more gold would be sent for the present, had much to do with the recovery in the final dealings.

On Tuesday the market opened with a better feeling, based upon reports that the shipments of gold had been automatically checked by the stringency in money and also by the issue of sterling loans. There was a sharp rise in Whisky and Sugar, and Reading was sold on a report that the State Senate Investigating Committee would recommend vigorous measures against the coal combination. Afternoon there was a rally on the announcement that one of the bankers had reduced rates to \$4.85½ for long and \$4.88 for short, and about the delivery hour there was a very decided advance all through on news that the Anti-Option bill had gone over until after the recess. It was learned that several bankers have taken advantage of Secretary Foster's plan of domestic exchange, and have already added \$800,000 to the Government gold balance in exchange for an equal amount of currency, and further that nearly the entire amount of gold recently surrendered to foreign dealers will be speedily recouped.

United States bonds closed as follows:

U. S. 4½s, 1891, extended.....	100
U. S. 4s, 1907, registered.....	113
U. S. 4s, 1907, coupon.....	114
U. S. currency 6s.....	107

The market for money was active and irregular, closing with a heavy break in stocks. Bonds have generally declined. Money was bid up on Friday and again on Monday as high as 30 or even 40 %, with many transactions on an average of 15 %, but fell to 8 % at the close. Time con-

tracts were but slightly affected, and the supply was ample. Commercial paper was in fair demand from the city banks, but there was little inquiry from the interior. Rates were 5 % for 60 to 90 day indorsed bills receivable, and 5½ to 6 for good single names. The bank returns showed a loss of \$527,400 in cash and of \$64,575 in reserve, leaving the latter at \$5,445,225. In London discount rates are the lowest in December for many years.

The grain markets were quiet and presented the same unsettled and depressing features observed when wheat was several cents higher than at present. The low price now reached would seem to encourage exports, but in the face of low cables and enormous supplies the market has no strength. Corn is in a much better position. Dry goods jobbers receive good reports from the West and Northwest, while the South is in a better position than it has been for several years, and it is still improving. Collections are good, while prices are as firmly held as ever. Cotton is a fraction higher, but speculation is less active. Spot coffee is dull and weak.

Official statistics of the commerce of the whole country for November show that the exports for the month were \$11,000,000 less than for November, 1891, while the imports were \$8,000,000 larger in merchandise and \$2,500,000 more including the specie account than for the same period of last year. For 11 months the total balance of trade is \$105,000,000 in favor of the United States, which is \$35,000,000 less than it stood at the same date of the previous year. The net exports of gold during 11 months were \$47,742,000.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, December 21, 1892.

Scotch Iron warrants have been very slow, with price almost stationary at 41/8. Early in the week there was some appearance of firmness, but willingness of holders to realize prevented an advance. Cleveland warrants stiffened to 38/, under the influence of purchases to cover over-sold accounts and rumors that more remain to be covered before the end of the year. Hematites have been slow at about 46/. Stocks in public stores include 341,000 tons Scotch and 20,000 tons Cleveland. There are 76 Scotch furnaces in blast.

Pig Tin sold up early in the week owing to scarcity of spot stock and apparent firmness of largest holders, together with reports of reduction in American stocks. Subsequent realizations and some pressure to sell, due to slow consumptive demand, caused a reaction under which prompts dropped to £91. 7/8 on Tuesday.

There was a slight decline in Copper early in the week, due chiefly to realizations and slow trade demand, but the market subsequently improved in tone, although showing no activity. Visible supply increased 496 tons, and spot stocks increased 104 tons during the first half of the month.

Furnace material less active, but very firm. A block of 200 tons American Matte went at a price not transpired, and it is reported that a large lot of Anaconda was recently placed, to arrive, on basis of terms yet to be agreed upon.

Tin Plate market continues dull, and prices are rather weak. Larger buyers

decline to pay present rates and are simply pushing shipments on former purchases. Makers look for better prices in the future, and are reluctant to book orders far ahead.

Scotch Pig Iron.—No change in the market for makers' brands. Business chiefly at former prices and moderate in volume.

No. 1 Coltness, f.o.b. Glasgow.....	55/
No. 1 Summerlee, " ".....	53/6
No. 1 Gartsherrie, " ".....	52/
No. 1 Langloan, " ".....	53/
No. 1 Carnbroe, " ".....	44/
No. 1 Shotts, " at Leith.....	63/
No. 1 Glengarnock, " Ardrossan.....	49/6
No. 1 Dalmeilington, " ".....	49/
No. 1 Eglinton, " ".....	46/6
Steamer freights, Glasgow to New York, 1/:	
Liverpool to New York, 7/6.	

Cleveland Pig.—Business has been more active, but the market is irregular, with sellers of makers' Iron at 37/, f.o.b. shipping port, for No. 3 Middlesborough.

Bessemer Pig.—The market is very quiet and prices tend in buyers' favor. Holders offer at 47/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Demand moderate, and no change in makers' prices. English 80 % quoted at £11. 11/3, f.o.b. shipping port.

Steel Rails.—The market very quiet and prices easy, but showing no radical change. Heavy sections quoted at £4, f.o.b. shipping port.

Steel Billets.—Demand continues slow and prices still rather weak, but without quotable change. Bessemer, 2½ x 2½ inches, quoted at £4, f.o.b. shipping point.

Steel Blooms.—Very little doing, and the market rather weak. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Steel Slabs.—Demand light, but makers hold for former prices. Bessemer quoted at £4, f.o.b. at shipping point.

Old Iron Rails.—There has been little business and buyers and sellers are wide apart. Tees quoted at £2. 10/ @ £2. 12/6 and Double Heads at £2. 15/, f.o.b.

Scrap Iron.—A moderate business passing, chiefly at old prices. Heavy Wrought Iron quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—The market very quiet and prices still nominal. Bessemer quoted at £2. 7/6 @ £2. 10/, f.o.b.

Manufactured Iron.—There is no improvement in the demand in any quarter and the moderate business passing is at former prices. We quote, f.o.b. Liverpool:

Staff, Ordinary Marked Bars	8 5 0 @ 8 10 0
" Common	6 7 6 @ 6 10 0
Staff, B.P. Sheet, singles.....	7 10 0
Welsh Bars (f.o.b. Wales).....	5 7 6 @ 5 10 0

Tin Plate.—No change in the market at the close. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	13/6 @ 13 9
IC Bessemer Steel, Coke finish.....	12/3 @ 12 6
IC Siemens	12/6 @ 12 9
IC Coke, B. V. grade 14 x 20.....	12/0 @ 12 3
Charcoal Terne, Dean grade.....	11/9 @ 12/

Pig Tin.—The market slow at the close and prices barely steady. Straits quoted at £91. 7/6 for spot and £90. 12/6 for three months' futures.

Copper.—Quiet market at the close and prices easy. Merchant Bars quoted at £46 12/6 spot and £47. 2/6 three months' futures. Best selected, £52.

Lead.—Market has been quiet but prices are rather firmer at £9. 17/6 for Soft Spanish.

Spelter.—Demand fair and the market firmer at £18. 7/6 for ordinary Silesian.

The World's Fair Boiler Contract.

E. D. Meier, who signs as "President of the Temp. Association of Boiler Companies," has written from St. Louis to the *Chicago Tribune* a letter in which he presents the following outline of the whole matter:

In February of this year specifications for boilers were sent out by the Chief of Construction to all the boiler works of the country, which he could reach, with a letter asking for bids. The Heine Safety Boiler Company of St. Louis was among the bidders, and their proposition for a part of the plant was considered so fair by the management that they were twice offered the entire plant at the same proportionate figure. As president of the Heine Safety Boiler Company I went to Chicago and had an interview with the officials in charge of the matter and explained to them that while we appreciated the value which the installation of the entire plant would have for us as a matter of prestige, it did not seem fair to other boiler companies equally entitled to consideration. It was then decided that the plant was to be equitably divided among seven boiler companies of acknowledged standing and reputation, all making different kinds of the same general type of water-tube safety boilers. The old-style tubular boilers were excluded, and only such water-tube boilers as had an established reputation were admitted to this apportionment. One of these companies withdrew under some misunderstanding of combined guarantees asked of all. The quota was then divided among the remaining six. The Stirling Company had their fair opportunity for competition and were excluded because the other six companies did not wish to enter into any combination with them under the mutual guarantees expected.

The six companies agreed that I should represent them as president in this temporary association in making all the preliminary arrangements. The instructions from the chief of construction under which these agreements were drawn contained this clause: "The boilers to be run under one management organized by yourselves and subject to me and my rules, you to guarantee the service among yourselves and as a whole body to us." The contracts as finally drawn contain at least two provisions which none of the six companies would have signed except on full belief in the ability of the other five to carry out individually their parts of the agreement. Separate contracts were drawn simply because it was found that separate bonds would be necessary, but the moral obligations on the part of the six boiler companies and of the exposition company remained the basis of these contracts. There was finally a distinct agreement that, owing to the intimate relations which must exist among the contributors to this plant, no additional power was to go into this main boiler house except with the consent of these six companies, and that they were to have the first right to furnish such additional power at the same terms as the original quota. This agreement was twice recognized in important transactions by the exposition authorities. When additional power in this boiler-house was thought to be necessary the six companies—viz.: The Campbell & Zell, the Abendroth & Root, the Stearns Mfg. Company, the National Water Tube Boiler Company, the Heine Safety Boiler Company, and the Babcock & Wilcox Company—agreed that the last named company was to furnish this additional quota, since the space was immediately adjoining their exhibit. The award was made and work commenced by the Babcock & Wilcox Company. The Stirling Company, in now trying to have this decision changed, is not merely trying to get into the exposition, but is attempting to force itself upon six companies which have distinctly declared that they did not wish it as a member of the syndicate.

The six companies should be conceded to have good grounds for their decision in this matter, which was reached early last spring and has been since adhered to. They simply insist on rights which have been guaranteed to them, and have not the slightest objection to the Exposition Company putting in as many Stirling boilers as they wish in another boiler house.

The Stirling Company have an office in Chicago, just as the six companies of the syndicate have. The Stirling boilers are built in Barbertown, Ohio. The other boilers are built respectively in Pennsylvania, New Jersey,

New York and Maryland. The only company which built two-thirds of their World's Fair boiler plant in Chicago is the Heine Safety Boiler Company. We have never made that any reason for any special favors at the hands of an exposition company which represents the whole United States.

I have sent an appeal from the decision of the Council of Administration to Director-General Davis, and have faith enough in the fairness of the exposition managers to believe that we will be accorded an opportunity of being heard before our rights are taken from us.

Consolidation in the Cast Pipe Trade.

It is reported that very important movements are under way among the manufacturers of cast-iron pipe. The industry has been in an exceptionally depressed condition, prices having fallen to a very unremunerative level. The result has been that the Western works as one group and the Eastern pipe founders as another have undertaken a consolidation of the leading interests, the ultimate object being to fuse these two groups into one large concern, which is to manufacture and distribute the product for the whole country. It is reported that negotiations have progressed to a very favorable point, and it is not impossible that the plans will soon be consummated. The total output of the cast-iron pipe plants of the country is not very far from 600,000 gross tons per annum. There has been a certain amount of displacement in the industry during the past few years, the Southern works, notably in Alabama and Virginia, being eager competitors for business at distant points.

At a meeting called at the office of A. R. Whitney & Co. on Monday, December 5, 1892, to form an Auxiliary Association of the Hospital Saturday and Sunday Association, A. R. Whitney was elected president, William Bispham of William H. Wallace & Co. vice-president, C. W. Ogden of Ogden & Wallace secretary, and D. A. Nesbitt of A. R. Whitney & Co. treasurer of the Metal Trade Auxiliary Association of the Hospital Saturday and Sunday Association. On motion of Mr. Bispham, circulars were ordered to be addressed to all those connected with the metal business in the city of New York asking them to concentrate their subscriptions by sending them to the treasurer of the Metal Trade Auxiliary Association, D. A. Nesbitt, 29 Broadway. Checks to be drawn to the order of Charles Lanier, treasurer.

The Western Freight Association, which met in Chicago last week, made the following changes, among others: Pig iron, carloads, \$2 per gross ton, Mississippi River to Missouri River; \$2.30 to Lincoln and \$2.60 to Beatrice. Manufactured iron, 10 cents per 100 pounds from Chicago and Milwaukee to Davenport, Rock Island and Moline.

The West is interested in the announcement which has just been made that a new trunk line has been opened between Chicago and the seaboard. The construction of a short piece of railroad from the Norfolk & Western to Columbus, Ohio, completes a through line from Norfolk, Va. With the extension the Norfolk & Western controls over 1500 miles of road. It is a direct competitor with the Chesapeake & Ohio for Chicago business to Virginia and the Carolinas, but is also a competitor with the old lines for the export trade. A new freight line has already been established, to be known as the Norfolk & Western Dispatch.

The Shultz Belting Company, St. Louis, Mo., have just shipped to the DeBardleben Coal & Iron Company 70 blast furnace valves. They recently shipped a large order of furnace valves to the Colorado Fuel & Iron Company, Denver, Col.

HARDWARE.

Condition of Trade.

THE APPROACH of the holiday season and the indisposition to purchase freely during the closing days of the year reduce the volume of general business to a minimum. The trade which is being done is largely in holiday and winter specialties, the demand for which is stimulated by the cold weather. As usual at this season, negotiations are in progress between the large jobbing houses and the manufacturers in regard to orders for next season, and we are advised that already a good many orders have been placed. The outlook for business is regarded as promising and a hopeful feeling certainly characterizes the trade. Prices continue without important change. Collections are generally referred to as good.

Chicago.

(By Telegraph.)

The situation in Shelf Hardware is unchanged. Current business runs mainly to small orders for sorting up, which aggregate a fair volume, but cause a disproportionate appearance of activity. Heavy Hardware keeps up very well, notwithstanding the rapidly approaching end of the year. Manufacturers' agents are quite busy booking good orders for spring in Screws, Bolts, Nuts, &c. The Screw situation has improved materially, the manufacturers having evidently adjusted their differences. Bolt and Nut works are much behind in deliveries, and urgent appeals are daily coming in for more prompt shipments, but higher prices cannot be obtained for some reason. Collections are good.

St. Louis.

(By Telegraph.)

Jobbers report a decided falling off in the demand for staple goods. The holiday season is here and everything else has to give way to it. Traveling men are in off the road and sales are limited almost exclusively to holiday goods. There is some improvement in the demand for such winter goods as Skates, Sleds, &c., brought about by the cold weather at present prevailing in the West and Northwest. Retailers are getting ready to take their annual inventory, and nothing in the way of active trade can be expected until after the turn of the year.

Notes on Prices.

Cut Nails.—As usual at this season there is a moderate demand and prices continue without special modification. There is however, perhaps a slight tendency toward increased firmness and man-

ufacturers are certainly showing a disposition to refuse to make further concessions, in some instances extremely low quotations having been withdrawn. The policy pursued by the Eastern manufacturers of stopping production for awhile is apparently having a good effect, preventing the accumulation of Nails and aiding in giving some tone to the market. The Eastern prices are fairly represented by the quotation of \$1.40 to \$1.45 for carload lots at mill on a 35 cent average, but it is not difficult on attractive orders to shade these figures slightly. Prices in New York City are \$1.75 to \$1.85 for small lots from store. Carload lots on dock are held at \$1.60 to \$1.75 according to average.

Chicago, by Telegraph.—Cut Steel Nails are not wholly lifeless, as the local makers are steadily receiving orders and specifications on contracts. Some of the outside Nail factories have introduced a new feature in the trade, making consignments to large retailers to be sold on commission. Prices are unchanged at \$1.60 to \$1.62½ on 30 cent average for factory lots and \$1.65 to \$1.70 for small lots from stock.

Wire Nails.—There is little new to report in regard to the Wire Nail market. Carload lots at mill are held at \$1.45, a figure which is only slightly shaded on the largest orders, and which, on the other hand, a few of the mills refuse to meet. The market is not characterized by a very confident tone in view of the fact that it remains to be seen what the effect will be of the competition of some manufacturers who have not hitherto been prominent in the market. The volume of business is good considering the season, and inquiries are frequent, not only from large jobbing houses, but also from large retailers.

Chicago, by Telegraph.—Very free inquiries are reported for Wire Nails, but buyers are slow to close contracts with manufacturers. The general quotation from factory is \$1.60, Chicago, and most manufacturers are adhering firmly to this price for straight carloads. Jobbers quote \$1.70 @ \$1.75 for small lots from stock.

Barb Wire.—The Barb Wire market is characterized by active competition and prices are low and somewhat irregular. The price is represented by the quotation of \$2.40 for Four-Point Galvanized at mill, but large orders have been placed at at least as low as \$2.35. While manufacturers are ready to make very close prices for immediate delivery they are more conservative in regard to contracts for future delivery, it being intimated that prices will probably be higher. The regular quotation for small lots from store in New York is \$3.10 for Four Point Galvanized.

Chicago, by Telegraph.—Barb Wire is in better demand than last week and large inquiries are being received for spring shipment. Plain wire is very firm and this is taken as a good omen for the Barb Wire

trade. Manufacturers are asking a stiff advance on Barb Wire for spring delivery, returning to their old quotations of \$2.35 for painted and \$2.70 for galvanized. The cheap sellers seem to have either loaded up with orders or to be determined to get a better profit on their goods. Prices for immediate shipment are somewhat lower than for spring delivery, but not so low than they have been.

The tone of the market is certainly more cheerful than it has been. Jobbers quote \$2.30 @ \$2.75 for small lots from stock.

Rope.—During the past week the Cordage market has been characterized by a slight weakness, and while prices are not quotably lower, special figures which have been made by the manufacturers are now more general, and it is not improbable that lower prices may prevail.

Tacks.—During the past season prices of Tacks have run along evenly, and this market has been in a more satisfactory condition than for some time, the competition between the manufacturers not having been apparently quite as animated as sometimes, and the tendency is rather toward slightly advanced prices.

Whips.—American Whip Company, Westfield, Mass., are bringing out ten new styles of Whips known as the Ten Americans, which are to retail at from 50 cents to \$3 each. These are put up in an assorted package containing 75 whips to retail for \$75 and are sold to Hardware dealers at a discount of 33½ per cent. These Whips are made in American Whip Company's best style and are guaranteed by them to be as represented.

Glass.—Reports from Pittsburgh Window Glass factories indicate a heavy demand for Glass, which is unusual for this season of the year. This condition of affairs is attributed to the prosperous season among the building trades and to the open winter, which allows building to go on almost uninterruptedly. Local dealers are fairly busy, and prices quite uniformly adhered to. The imported Glass market is characterized by the same general features as the domestic, and the trade express themselves as satisfied with existing conditions. The increased demand for Plate Glass has not affected prices materially, it still being sold at a small profit. At the meeting of the Window Glass manufacturers held in Chicago last week, existing prices were reaffirmed, which are as given below: American Window Glass, 1000-box lots or more, 80 and 15 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 2½ per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

New Steamer Communication with River Plate Ports.

WILLIAM M. IVINS, the able president of the United States & Brazil Mail Steamship Company, arrived in New York December 18 on the steamer "Seguranca" of that line from an extended tour of inspection commenced June 6, through the West Indies and South America. His first stop outward bound was at St. Thomas, thence to Martinique, Barbados, Para, Maranhao, Ceara, Pernambuco, Bahia, Rio de Janeiro and Santos. From Santos Mr. Ivins proceeded south, visiting the River Plate ports in Uruguay and Argentina, the object of his trip being to determine whether or not it would pay his company to compete for the contract for carrying the United States mails between New York and Montevideo, Buenos Ayres and Rosario. Personal investigation convinced him of the practicability of the venture, resulting in his cabling to the company here to bid on the contract, which was secured. The first steamer of the new line for the River Plate sailed October 3, completing the first round trip December 9, when she arrived in New York. The mails were carried from here to Montevideo in 22 days, thus breaking the record. Heretofore the mails from New York had gone to Rio de Janeiro, there to be transferred to another steamer, or they had been sent to London for transshipment on a direct steamer for Montevideo, requiring in either case from 30 to 40 days. The contract concluded with this Government calls for a mail steamer from New York to Montevideo, Buenos Ayres and Rosario every 40 days, and other steamers will be dispatched as often as a cargo is offered. As a matter of fact, the steamers scheduled to sail in the immediate future for these ports are as follows—viz.: "Pharos" or another vessel, January 7; "Finance," January 19; "Enchantress," February 8, and "Advance," February 28, 1893. From the Argentine Republic Mr. Ivins returned to Brazil, spending much time at the company's ports in that country taking steps which secured for the company rights and privileges under their contract in the shape of warehouses, lightering and shore facilities, &c. Offices of the company have been established in Rio and Santos, and the work of withdrawing the business of the company from the hands of foreign agents and putting it into the hands of Americans has been completed. An American has been in charge of their interests at Santos for some years. Captain Baker of the line was sent to Rio de Janeiro in advance of Mr. Ivins and put in charge there. General Superintendent George A. Burt of the company sailed for Rio October 24, on the "Seguranca," to supervise the entire Brazilian, Uruguayan and Argentine business of both of their lines, and will remain there for the present. Mr. Ivins took a corps of clerks and assistants to South America and distributed them at leading points. This company own five steamships and have eight others under charter. George H. Brewer, the junior

partner of Paul F. Gerhard & Co., the general agents of the company in New York, has assumed the duties of Mr. Burt in his absence.

Export Notes.

William E. Peck, export commission merchant, 62 William street, New York, sailed December 7 on the steamer "City of New York" for Liverpool, this making the third trip to Europe this year in connection with the business recently established there, having made two trips last summer aggregating eleven weeks. He has an office and corps of clerks in charge of a manager at Manchester House, Friday street, London, E. C., and correspondents in Paris, Hamburg and Vienna for the placing of American products, manufactured and other, in Great Britain and on the Continent. This is in addition to the business established with South America ten years ago and later with Australia, the West Indies, Mexico and Central America. This house reports a satisfactory trade with South America, their bills of lading on the direct steamer "Barden Tower," now in berth, aggregating, they say, \$30,000 worth of American goods for distribution at the various West Coast ports.

As indicative of the growth of the export of Agricultural Implements from this country, it may be said that a leading house in this city two years ago sent to agents in Paris a sample lot of 30 Harrows made in a neighboring State. The following season 2000 were sent, and for the season of 1892 an aggregate of 6000 will not more than cover the number.

In this connection it may be said another Agricultural Implement manufacturing company sent about the same time a consignment of half a carload of Plows. In 1891 the traffic had grown to five carloads, while for 1892 over ten carloads have been sent for distribution in France, Algeria, &c.

A. Hoffnung of S. Hoffnung & Co., of London, New York, and Sydney and Brisbane, Australia, returned to Great Britain on the Cunard liner "Etruria" December 17, being the same steamer he came over in November 5 last, on business connected with their various interests.

Johan Koopmans of Johan Koopmans & Co., 302 Keizersgracht, Amsterdam, Holland, is now in this country looking after desirable manufactured goods, also farm products, &c., for distribution to the trade in Europe through his house, they being agents and commission merchants for American goods. Mr. Koopmans has been coming to this country on a similar mission for 15 years and is doing his best to impress European merchants with the desirability of many of our goods. Correspondence addressed care of J. Agostini, 62 Broad street, New York, will reach him. He expects to sail for home early in January.

Charles M. Coulter, secretary of the Walter A. Wood Mowing & Reaping Machine Company, sailed in November for

Europe for the purpose of inspecting the company's various branches, intending to go from there to the River Plate ports and across country by the Transandine Railroad to Valparaiso, &c.

Chopin Bros., who are supposed to represent a syndicate of American capitalists, have obtained a concession for a railway from Esperanza, a thriving town on the Mexican & Vera Cruz Railway, to Suchil, a small place in the State of Vera Cruz, Mexico, through a rich agricultural region, the concessionaires depositing \$500,000 in the National Treasury as an earnest for the faithful performance of the contract.

There are reports in Mexico of a movement on foot to combine all the Iron industries of the country.

Peru is said to have established a gold standard and limited the coinage of silver as well as its legal tender value. The maximum coinage is fixed at 4,000,000 sols and the legal tender maximum at 20 sols (the value of a Peruvian sol in United States gold being \$0.9647).

J. S. Piza of the export commission firm of Piza, Nephews & Co., 18 Broadway, New York, doing a large export and import business with Central and South America, is now on his way home from a trip to Europe. Having arranged to join the White Star steamer "Teutonic" at Queenstown he unfortunately missed the mail train at Dublin. Hesitating but a moment, he arranged with the railway officials for a "special" consisting of an engine, tender and one carriage having the right of way. The distance, 180 miles, was covered in 200 minutes, a special steamer having been arranged for to carry him from the quay to the "Teutonic" lying off Roche's Point. As the tender approached the Transatlantic flier, her anchor was being catted and propellers just beginning to turn, but before she was fairly under way Mr. Piza and his luggage were put safely on board. Mr. Piza is a member of the new Spanish Club in New York—the Circulo Colon-Cervantes.

A New York house, who are extensive commission merchants for the sale of tropical fruits and vegetables, are said to have rented a large farm at Guines, Cuba, for the purpose of cultivating early farm products according to American methods for this market, taking laborers and seeds from New York. If this enterprise succeeds the intention is to greatly extend it, as communication is both quick and frequent, with no fear of frost cutting off the crop.

A meeting of the United Australasian Axemen's Association was recently held at Latrobe, for the purpose of discussing Axes, their best shape, size, &c. A number of Axes of different makes were on exhibition, also several paper models. After the matter was thoroughly discussed by the experts and others present it was decided that an Axe of the following dimensions was the

best for quick work : Greatest width of blade, $5\frac{1}{2}$ inches to $5\frac{1}{2}$ inches ; width of blade at bottom of eye, $4\frac{1}{2}$ inches to $4\frac{1}{2}$ inches ; width on top of poll, $3\frac{1}{2}$ inches ; depth of poll to top of eye, $\frac{1}{2}$ inch ; greatest depth of eye, $2\frac{1}{2}$ inches ; diameter for handle at greatest point within the eye, $\frac{1}{2}$ inch ; depth of blade from eye, 4 inches to $4\frac{1}{2}$ inches ; Axe to taper gradually from the eye and to run nearly even in thickness all across ; thickness of poll, $1\frac{1}{2}$ inches to $1\frac{1}{2}$ inches ; total depth from top of poll, $7\frac{1}{2}$ inches ; weight of Axe, including handle, to be $5\frac{1}{2}$ pounds to $6\frac{1}{2}$ pounds ; best weight, just 6 pounds.

The Meline Committee report, in favor of a minimum tariff on specified American products, has just been distributed among French Deputies, the preamble to the bill saying: "The mutual friendship and good will of France and the United States will render an understanding easy of accomplishment. The convention undoubtedly would be advantageous to France."

The Bureau of American Republics is informed that the Transandine route connecting Buenos Ayres with Valparaiso is now so far available that arrangements have been consummated by the Royal Mail Steam Packet Company for regular through traffic during the current season.

The Hardware Club.

AT A MEETING of the Board of Governors of the Hardware Club of New York, held on Tuesday, the following new members were elected :

FREDERICK A. BAGG,
Standard Tool Company,
New York.

THOMAS BRESLIN,
Waterford, N. Y.

LEANDER H. CRALL,
Times Building, New York.

F. B. EARLE,
Richardson Bros., Newark, N. J.

JAMES L. PARSON,
270 Broadway, New York.

HENRY B. SARGENT,
Sargent & Co.,
New Haven, Conn.

HORACE B. SHATTUCK,
Horace B. Shattuck & Son,
Lowell, Mass.

RANDOLPH W. TOWNSEND,
247 Broadway, New York.

Our readers will be interested to know that arrangements for the next Hardware dinner are progressing satisfactorily. It has been decided to hold the dinner on Tuesday evening, February 21, in the Manhattan Athletic Clubhouse, corner of Madison avenue and Forty fourth street.

THE TRADE WILL OBSERVE among the Special Notices one signed "New York and Pennsylvania." The advertiser is a salesman of experience and has an extensive acquaintance in the States indicated. He is at present selling Cutlery for a leading concern on commission, and desires agencies of Hardware specialties or staple goods which he can sell and offer as side lines.

Bicycles.

BUT A FEW YEARS AGO it was the exception to see a Bicycle and rider upon the streets, and probably nine out of every ten men would have given as their opinion that the Bicycle craze would soon die out. Now there is hardly a village which cannot boast of one or more wheels, while the majority of towns have well organized Bicycle clubs. The universal belief now is that Bicycles have come to stay, and they are certainly growing more in favor each year.

The rapidity with which Bicycle manufacturing have increased as the natural result of this growing demand is a striking illustration of business enterprise, and yet each season has found the supply of machines short of the demand; and this notwithstanding that in addition to home production, large quantities of Bicycles are imported. The extent of the industry in this country is indicated by the following list of the more prominent manufacturers:

AMERICAN ORMONDE CYCLE Co., New York.
AMES & FROST Co., Chicago.
ARIEL CYCLE MFG. Co., Goshen, Ind.
GEO. R. BIDWELL CYCLE Co., New York.
BRETZ & CURTIS MFG. Co., Philadelphia.
BROWN BROS. MFG. Co., Chicago.
BUFFALO WHEEL Co., Buffalo, N. Y.
CAMPBELL MFG. Co., New York.
CHAPMAN HARDWARE Co., Toledo, Ohio.
COVENTRY MACHINISTS' Co., Boston.
DERBY CYCLE Co., Chicago.
EAGLE BICYCLE MFG. Co., Torrington, Conn.
ECLIPSE BICYCLE Co., Beaver Falls, Pa.
ELLIOTT HICKORY CYCLE Co., Newton, Mass.
ELMORE MFG. Co., Elmore, Ohio.
FREEPORT BICYCLE MFG. Co., Freeport, Ill.
GORMULLY & JEFFERY MFG. Co., Chicago.
GENDRON IRON WHEEL Co., Toledo, Ohio.
HACKNEY BICYCLE Co., Cleveland, Ohio.
HAMMOND & COOLEY, Batavia, N. Y.
HARTFORD CYCLE Co., Hartford, Conn.
HIBBARD, SPENCER, BARTLETT & Co., Chicago.
HORTON, GILMORE, McWILLIAMS & Co., Chicago.
HULBERT BROS., New York.
ILLINOIS CYCLE Co., Chicago.
KEATING WHEEL Co., Holyoke, Mass.
KENWOOD MFG. Co., Chicago.
KIRKWOOD, MILLER & Co., Peoria, Ill.
JOHN P. LOVELL ARMS Co., Boston.
H. A. LOZIER & Co., Cleveland, Ohio.
MARBLE CYCLE MFG. Co., Plymouth, Ind.
MONARCH CYCLE Co., Chicago.
NEW YORK CYCLE Co., New York.
ORANGE MACHINE & MFG. Co., Orange, N. J.
OVERMAN WHEEL Co., Chicopee Falls, Mass.
PEERLESS MFG. Co., Cleveland, Ohio.
PHELPS & DINGLE MFG. Co., Passaic, N. J.
GEO. N. PIERCE & Co., Buffalo, N. Y.
POPE MFG. Co., Boston.
PREMIER CYCLE Co., New York.
THE RAYMOND BICYCLE Co., Boston.
WM. READ & SON, Boston.
RELAY MFG. Co., Elyria, Ohio.
REMINGTON ARMS Co., Ilion, N. Y.
ROCHESTER CYCLE MFG. Co., Rochester, N. Y.
ROYAL CYCLE WORKS, Marshall, Mich.
ROUSE, DURYEA CYCLE Co., Peoria, Ill.
SCHOVERLING, DALY & GALES, New York.
SERCOMBE BOLTE MFG. Co., Milwaukee, Wis.
SINGER & Co., Boston.

H. B. SMITH MACHINE Co., Smithville, N. J.
THE STAHL BICYCLE Co., Boston.
STANDARD MFG. Co., Indianapolis, Ind.
E. C. STEARNS & Co., Syracuse, N. Y.
STERLING CYCLE WORKS, Chicago.
STOVER BICYCLE MFG. Co., Freeport, Ill.
SVENSGAARD BICYCLE Co., Fergus Falls, Minn.
SWEETING CYCLE Co., Philadelphia.
TOLEDO BICYCLE Co., Toledo, Ohio.
UNION CYCLE Co., Boston.
WARWICK CYCLE MFG. Co., Springfield, Mass.
WASHINGTON CYCLE Co., Washington, D. C.
WESTERN WHEEL WORKS, Chicago.
WHITTEN GODDING CYCLE Co., Providence, R. I.
W. H. WILHELM & Co., Reading, Pa.
WINTON BICYCLE Co., Cleveland, Ohio.
WILSON MYERS & Co., New York.
YOST MFG. Co., Toledo, Ohio.

Each year the manufacturers of Bicycles are seeking the Hardware trade to a greater extent as the best channel through which to market their machines. In many cases jobbers control the entire output of certain brands of machines, or control the machines in a given territory. Other wholesale houses have machines manufactured by reliable makers under names of their own. Many makers consider the retailer the most desirable to introduce their Cycles to wheelmen, and the retail merchant has become in a great measure the recognized distributor of these goods. It is a line of goods upon which there is a good profit, and which merchants have found desirable to handle.

The improvements in Bicycles have been as rapid as the increase in the number of manufacturers, and a number of new features will be introduced in some of the machines for 1893. There is apparently a tendency toward a frame patterned after the Humber style, having a long socket, ball bearing head, and long wheel base. In the racing or very light scorching wheels these two features are likely to be more pronounced. Indications point to the pneumatic tire as the tire of the year, which will to a considerable extent supersede the solid and cushion tire. The danger from collapse which retarded the introduction of the pneumatic tire has given way before the improved tires of the present time and the several simple and effectual remedies now available for repairing punctured parts.

The rat-trap pedal, which until recently has been regarded as a racing accessory only, has many advantages which lead to its adoption on wheels of all kinds. A radical departure is the disposition of some manufacturers to omit the brake and mud guard, but the advisability of leaving off the brake may be questioned by older wheelmen. The handle bars will be gracefully curved, after the cow-horn style, although some makers are endeavoring to introduce a straighter and higher bar, with the view to remedying the stooping tendency. On the lighter machines a higher gear, 56 to 60, has been found to be an advantage and will be largely used.

Attention has been given, in an experimental way, to improving the chain and to methods for inclosing it and the gear wheels. The finish of machines will be generally black enamel with bright parts.

nickeled. There is a growing demand for cheaper wheels, and while the high-grade wheels will continue to sell at from \$150 to \$175, and at even \$200 for racing machines built to measure, there will be an increase in the number of cheaper wheels, some of these being of a high order of workmanship and merit. Among the novelties which are to a great extent still in the experimental stage are the geared ordinary, the all aluminum safety, the disk or spokeless wheel, and an inflated rubber wheel, fastened to the axle by steel disks.

Jobbers, Retailers and Department Stores.

IN A GOOD MANY of the larger cities the Hardware trade is feeling the effect of the competition of department stores, especially in the line of House-Furnishing Goods and such other Hardware articles as are generally handled by them. In order to check this tendency as much as possible associations of Hardwaremen in some of the different cities have been organized, and by them action has been taken to induce manufacturers to refrain from selling the department stores. Some of the manufacturers, however, are unwilling to do this, and the result has been that in some instances they have lost the Hardware trade, counting on the whole that their interests are better served by selling to any class of merchants who desire their goods. Manufacturers who are desirous of retaining their Hardware customers in such cities are obviously in a somewhat difficult position. As representing the way in which the matter appears to a manufacturer under such circumstances we give below an extract from a letter we have just received from a representative house who are embarrassed by the questions referred to above. It will be seen that under the circumstances in which they are placed the whole question of the gradation and regulation of prices to the different classes of buyers is brought up:

As our business increases and our goods become more popular and as we get new competition, troublesome questions arise which have not arisen before, and which seem to be the natural results of the introduction of any new line of goods. Recently in two different markets we have been practically boycotted by the Hardware Jobbers' Associations of these cities, the reason given being that we are catering to and selling to the department store trade, and we would like to ask you the following questions, and would ask you to frankly state to us your opinion upon such matters:

What constitutes a jobber?

Is a retailer entitled to jobbers' prices if he buys as many goods in the year as the jobber buys?

Should quantity purchases determine the price given?

Fearing that our questions may seem ambiguous, would state that we have heretofore sold those whom we considered to be jobbers at jobbers' prices, not requiring them to take any specified quantities, but with department stores and retailers we have

compelled them to take a minimum quantity of goods in order to get the jobbers' price. This has seemed to be quite satisfactory to jobbers so long as our goods were of slow sale, and the department stores did not buy the quantities we required them to buy; but now many of the department stores are enabled to buy the quantity and sell them, and the jobbers say they will not buy from a house who sell their goods to this class of trade at the same price at which they sell them to the jobbers.

We should like to hear from manufacturers or merchants in regard to the questions thus presented and invite a full and free discussion of matters which are of such practical interest to the trade. Many of our manufacturing concerns will sympathize with the perplexities of our correspondents, and many retail and jobbing houses are painfully familiar with the competition of department stores and other houses who are handling goods which properly belong in a Hardware store.

Protection to Merchants.

THE QUESTION as to the protection that should be accorded by manufacturers to their customers in the trade, as presented in the communication in our last issue, is obviously one of general interest. There is a disposition on the part of merchants to refer to the protection given in that instance as unsatisfactory, and many of our readers would evidently under such circumstances consider that they were unfairly treated by the manufacturer and be disposed to obtain their goods from another source. The point is forcibly made that selling the jobber at 70 per cent. and then going to his customers and offering the same goods at a discount of 67½ per cent. is inadequate protection. None of the manufacturers from whom we have heard touch upon this feature of the case, but we have the following communication from a well-known house in Pennsylvania, who discuss the matter in the following terms:

In answer to communication "Protection to Merchants" the jobbers (I speak of them as a class) are mainly responsible for condition complained of. By fair means or foul they beat the manufacturer down to and below the cost of production, abandon him on the slightest pretext and force him to seek the small trade or else shut down. In regard to the matter of small difference between price to jobber and retailer, the jobber generally gets the goods at close to cost of manufacture, and if the price to retail trade was based on a 10 per cent. margin the jobber would at once give 5 per cent. of it away and howl because he did not get another 5 per cent. to give it away also, while the poor manufacturer at the end of the year would in dismay look on wasted labor and capital. The jobbers thus dig their own grave, bury themselves and blame someone else for their foolishness. This is the experience of

A MANUFACTURER.

HENRY M. GAY advises us that he has made an arrangement with Woodrough & Hanchett Company, Chicago, by which he will continue to represent them in Wisconsin, Minnesota and Michigan. Mr. Gay has, we believe, traveled this route for 26 years, making him perhaps the oldest Hardware traveling salesman in the territory in question.

The Cut Nail Card.

THE LAKESIDE NAIL COMPANY of Chicago have vigorously followed up the suggestion made by the Southern Hardware Jobbers' Association by communicating with other Cut Nail manufacturers to get their views on the subject of revising the card so as to do away with the system of selling on averages. The replies they have received indicate a practically unanimous sentiment against the current practice and a disposition to unite on a card which would offer no inducement to continue it. By permission of the company we are enabled to offer the following extracts from some of the letters received, as indicating the feeling among the manufacturers:

A Wheeling manufacturer says:

We are in receipt of your favor and would say that we had a communication from the Southern Hardware Jobbers' Association on the same subject to which you refer. We replied that we were heartily in accord with their views and that the present system of selling Nails should be abolished if possible. We are ready to co-operate with a general move in the direction suggested.

Another Wheeling manufacturer writes in part as follows:

We recommend the adoption of the same schedule of extras as obtains at present on Wire Nails.

A third Wheeling manufacturer expresses his opinion as follows:

It looks to us as if the method of averages has come to stay unless a very radical change in the schedule of extras can be made. Just how to make that change, however, is one of those vexed questions about which the opinions of all doctors differ. To have a card satisfactory it must be a national card. So far as this company is concerned, we would be willing to adopt a national card if we thought such a card could be arranged, but we fear the job is a greater one than the average Nail man would be willing to undertake.

A fourth manufacturer in the Wheeling district writes:

We will co-operate with other Cut and Wire Nail manufacturers in any scheme which will dispense with the apparent necessity of figuring averages on Nails. Our present list of advances is reasonable, and if it could be adhered to we would be satisfied with it. The great difficulty, however, with all these matters in the past has been to secure unanimous co-operation among manufacturers, as you are no doubt well aware.

A fifth manufacturer in the Wheeling district says:

We note what you have to say in regard to a new Nail card being made somewhat in conformity with the present Wire Nail card. We fear if such a card was to be made it would not help matters much, except in Finishing, Casing, Fine and Clinch Nails. If you will refer to the Wire Nail card you will notice that the extras on 10d Common, for instance, are 50 cents, while ours are but 20 cents. Now, it is a well-known fact that every Cut Nail manufacturer is selling a 50-cent average at a much lower base price than a 20 cent average, and the result of a change to the Wire Nail basis would be that the prices of Common Nails, which are now fairly well adhered to, would be cut, while there would be no possibility of cutting on the smaller Nails.

A sixth manufacturer in the vicinity of Wheeling writes:

We are heartily in sympathy with the views of the Southern Hardware Jobbers' Association on the average plan of selling Nails, but when it comes to suggesting a remedy we hardly know what to say. The trouble is that the Hardware trade seems to want it both ways—that is, where they buy the large Nails they want the base fixed on the basis of high average, and when in want of small Nails they ask for special prices.

An Ohio manufacturer says:

In regard to the new Nail card the manufacturers seem to be trying to get together on, how would it do take the Wire Nail card and use that?

Another Ohio manufacturer writes as follows:

We will join the manufacturers of Steel Cut Nails in any plan that will do away with the present system of selling Nails on averages. We are willing to use any means that will get rid of the pernicious system we now have in selling Nails.

A western Pennsylvania manufacturer says:

We are heartily in sympathy with the efforts you are making to straighten out the Nail card and will do all we can to assist in that direction.

A Southern manufacturer writes:

We received a copy of the circular letter and are heartily in accordance with the request of the Southern Hardware Jobbers' Association and are glad to find that you are also. The present system of selling Nails is a nuisance in every respect and we are anxious to revise it. The Eastern factories have appointed a committee to revise the schedule of extras and would be glad to have the Western factories unite with them in making it a uniform card for this country.

Another Southern manufacturer says:

We beg to say that we are decidedly in favor of a change in the Nail card. We have been in favor of it for more than two years and have used our best endeavors to bring the change about. We are in the Nail business and expect to remain in it, and wish to see something done whereby we can show a little profit.

So much interest is shown in this question that it will not be permitted to drop by some of those interested. The action of the Eastern manufacturers is being awaited with the hope that they will take the initiative in getting up a proper card which will correct the existing annoyances. If the Eastern card proves satisfactory it will very probably be adopted by the West and be made a national card. If it is not satisfactory, steps will be taken to get the Western manufacturers together.

Sickels, Preston & Nutting Company's Catalogue.

SICKELS, PRESTON & NUTTING COMPANY, Davenport, Iowa, issue Vol. II of their Hardware catalogue for 1893. The catalogue is about 9 x 12 inches, bound in flexible cloth, and contains 148 pages. The line of goods shown include Rim and Mortise Locks, Cabinet Locks, Padlocks, Butts, Strap and T Minges, Gate Hinges, Blind Hinges, Parlor Door Hangers, Flush, Chain and Foot Bolts, Cupboard Catches, Thumb Latches, Sash Locks, Sash Lifts, Sash Balances, Brackets, Coat and Hat Hooks, Casters,

Bells, Lanterns, Faucets, Wrought-Iron Goods, Scales, Meat Cutters, Coal Hods, Shovels, Skates, &c. The book is well arranged, with list prices, and gives a view of their establishment. The alphabetical index is placed in the front of the catalogue.

Observations on American Hardware in Foreign Countries.

HARRY C. DISSTON, who reached home on Thanksgiving Day after a tour around the world, which was accomplished in eight months' time, reports a steadily increased demand for American Hardware, particularly in Australia, New Zealand and Southern Europe.

Mr. Disston's attention was particularly directed to Saws and Files and other specialties manufactured by Henry Disston & Sons, but he also noted that in some markets other American goods were assuming an important position, particularly Axes, Locks and Bolts and Nuts, and in Southern and Central Europe the Enterprise Mfg. Company's goods held a very prominent position. In Honolulu there is a growing trade in American goods, but owing to the depressed condition of the sugar industry general business is more or less affected, but it is believed to be only temporary.

In New Zealand trade is in a fairly good condition, and business with that country is gradually extending. In New South Wales, Queensland, Tasmania and Western Australia business is reviving, owing to an improvement in the sheep-raising industry, which is an important feature in that part of the world, and American goods are largely sold there. In Egypt there appeared to be no market for American goods, the demand being for something "showy and cheap."

The general result of Mr. Disston's observation appears to be that some lines of American Hardware have secured a permanent foothold in foreign markets, and that with judicious fostering a much larger business may be done, particularly in the countries above mentioned.

A Question as to Store Arrangement.

FROM A HOUSE in Iowa who are dealing in Heavy and Shelf Hardware, Agricultural Implements, Pumps, &c., we have received an inquiry in regard to the best methods of arranging a new store, in regard to which they will be pleased to receive suggestions from the trade. The matter is one of general interest and we take pleasure in laying their inquiry before our readers, from whom we shall be glad to have suggestions in reply.

We are fitting up a new storeroom for General Hardware. The building is 100 feet deep, 20 feet wide, with 16-foot ceiling. We would like the opinions of some good Hardwaremen as to how to shelve and furnish the inside in order to make it most convenient for the general line of Hardware, Stoves and Tinware; also what

style of shelving, whether standards or brackets, and width of shelving. Also how to finish in general.

Branford Lock Works.

AT A MEETING of the directors of the Branford Lock Works, held on Wednesday, December 14, John J. Kennedy resigned his position as president of the corporation and his resignation was accepted by the directors. Henry R. Towne, president of the Yale & Towne Mfg. Company, who has been one of the directors of the Branford Lock Works since the lease of the latter to the Yale & Towne Mfg. Company, was thereupon elected president for the unexpired term. Under the contract between the two corporations the Yale & Towne Mfg. Company have heretofore had direction and control of the Branford products, but not of the management of the works. The effect of the change above reported is to transfer to the Yale & Towne Mfg. Company the responsibility also of the manufacturing as well as of the sales department of the business of the Branford Lock Works. Mr. Kennedy retains his seat as a member of the Board of Directors.

Trade Items.

COPELAND HARDWARE COMPANY, Worcester, Mass., have established a retail tool store in connection with their manufacturing business at 291 Main street, where they display a line of Mechanics' Tools, Cutlery, and Skates.

THE SOUTHERN HARDWARE JOBBERS' ASSOCIATION have been in correspondence for some six or eight months with the Southern Railway & Steamship Association in regard to a more liberal classification of Hardware. Information has just been had, which leads them to believe that a new classification will go into effect January 1, 1893. If true, this will be of great benefit to the Hardware trade of the South. Knoxville, Tenn., is the headquarters for the Southern Hardware Jobbers' Association and W. E. Gibbins of W. W. Woodruff & Co. is president, and W. P. Smith of C. M. McClung & Co. is secretary. This association has recently had an accession of several prominent Hardware jobbers in the South who were not former members.

O. N. STEIN, manufacturers' agent and commission merchant, of Boston, Mass., has recently opened an office at 35 Warren street, New York, for the purpose of affording buyers an opportunity of seeing samples, obtaining prices and incidentally leaving their orders, goods to be shipped direct from factories. He is selling agent for the Columbia Grey Iron Company, Columbia, Pa.; New England Specialty Company, North Easton, Mass.; Cushman Mfg. Company, University Mfg. Company, Marietta Casting Company and Bless & Drake, covering a large line of Hardware and House-Furnishing specialties. He announces catalogues of the various companies will be sent on application.

WILLIAM CALDWELL of W. R. Grace & Co., who has immediate charge of their several sail and steamer lines, refers to the carrying trade between this port and San Francisco as excellent. The ship "Henry B. Hyde," registering 2400 tons, having sailed for that port December 4, full,

shutting out over 500 tons of cargo, which will be taken on the succeeding vessel, the "General Knox," of 2141 tons register, now loading at the foot of Vesey street, North River. The "Henry B. Hyde" was loaded in 19 working days, which they say is exceptionally fast.

JANNEY, SEMPLE & Co., of Minneapolis, Minn., propose to make a notable enlargement of their warehouse very shortly. They have secured the adjoining building, occupied at present by the W. S. Nott Rubber Company, and as soon as the latter move out they will pierce openings in the brick partitions and throw the whole into one large establishment. They will thus acquire 30,000 square feet of floor room, which is imperatively needed to accommodate their increasing trade. We are pleased to note this very conclusive evidence of the prosperity of this highly esteemed house.

THE MACHINISTS' SUPPLY STORE of Charles H. Besly & Co., 10 and 12 North Canal street, Chicago, was entered by burglars on the night of the 10th inst. The fire-proof vault was opened and \$180 secured. Two men were arrested on suspicion, one of them an employee and the other formerly an employee.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio, are sending with their compliments the Daily Reminder, a calendar, diary and memorandum combined. The card to which it is attached has yearly calendars for the years 1893 and 1894.

W. M. TAUSSIG, treasurer of Wiebusch & Hilger, and Thos. J. Leary, employed by the same house, sailed for Europe together early in October, in the interest of the concern to which they belong. Mr. Taussig, whose specialty is Cutlery, devoted himself to the manufacturers in England, France and Germany, while Mr. Leary, who confines himself to Firearms, spent his time in England and Belgium. Both gentlemen returned together, arriving December 7 on the steamer "Majestic."

ATLAS MFG. COMPANY, New Haven, Conn., have engaged to represent them in the West C. M. Avery, who from his connection with the Enterprise Mfg. Company of Philadelphia is well known to the trade throughout the country. The company advise us that the sales of their Steel Shelf Bracket have been very encouraging, its reception by the trade being most favorable.

ANNOUNCEMENT is made of the dissolution by mutual consent of the partnership of Walters & Mears, Hardware merchants, Rochester, N. Y. The business will be continued by George J. Mears, who assumes all the liabilities and collects all accounts due the former firm.

HENRY DISSTON & SONS, Philadelphia, are putting their Band Saws on the market in a new and very convenient shape. Coils up to 1000 feet in length are wound on a circular shaped block or board, from which any desired length can be cut from the roll. This will facilitate the handling, and will be appreciated by the trade in general.

WRIGHTSVILLE HARDWARE COMPANY, Wrightsville, Pa., are making additions to their plant, and have now in course of erection a three-story brick building 50 x 70 feet, to be used as a general warehouse and packing department, and are making preparations for further enlargement and improvement in the near future.

BRYAN MFG. COMPANY, Bryan, Ohio, send out with their compliments a thermometer, neatly mounted on a decorated

card, calling attention to the quality of their Wheelbarrows and their low price, considering quality.

"THE HISTORY OF A PURCHASE" is the title of an interesting pamphlet issued by the Bundy Mfg. Company, Binghamton, N. Y., who manufacture the Bundy Automatic Time Recorder. The pamphlet reproduces a letter written by a manufacturing concern who were about adopting the Bundy Time Recorder to ten manufacturers who already had it in use, and also gives the answers to this letter. The replies indicate that the Recorder is giving satisfaction, and that the manufacturers would not willingly return to the old system of time keeping.

PROMINENCE is given to correct shooting in a neat pamphlet sent out by Laffin & Rand Powder Company, New York, under the heading, "The Art of Shooting; Hints to Amateurs and Others." Illustrations show position for loading a gun; for carrying it on a long tramp; position for carrying when nearing game, and position for firing. The cuts are accompanied by some pages of information regarding the correct use of a gun. The book also contains information regarding the various grades of Sporting, Blasting and other Powders made by them.

THE PECK, STOW & WILCOX COMPANY, Southington, Conn., are now putting their Taylor's patent Auger Bits in upright hardwood boxes, a single piece of timber having holes, each the size of the Bit to be held (points up) being contained in a dovetailed outer case with rounded corners, the whole exterior being varnished. The top, about one-quarter the total length, is removable, being held in place by two brass hooks. These Bits are referred to by the company as well adapted for boring in hardwood, in the end of timber, diagonally, and for reaming. The Bits are put up in sets of 13 aggregating 32½ quarters. The company refer to the Bit business as exceptionally good, that department having been pushed continuously for a long time past.

THE MCKINNON DASH & HARDWARE COMPANY, Limited, Buffalo, N. Y., have purchased and are now carrying on at Columbus, Ohio, the business of the Wm. C. Reynolds Company, manufacturers of Carriage Dashes and Fenders.

IN REPLY TO INQUIRIES from the trade we would state that Wright, Dana & Co., Utica, N. Y., have in stock A. C. Palmer's patent Blind Hinges and Fast, which are no longer being manufactured, having been to a large extent superseded by cast-iron goods. They have in stock all sizes except Nos. 2 and 7.

A FIRE ORIGINATED in the Udell Wood-ware Company's building in St. Louis, December 19, at 6.45 o'clock in the evening, destroying the property in the territory bounded by Washington, Locust, Third and Fourth streets, resulting in the calling out of almost the entire fire department. It was nearly 11 o'clock when the flames were got under control, the estimated loss aggregating \$450,000, of which the Udell Company suffered to the extent of about \$150,000 on stock, largely covered by insurance.

AT FAYETTE R. PLUMB'S EDGE TOOL WORKS, the damage resulting from the recent fire having been fully repaired, the Warehouse floors have been relaid and strengthened, and other improvements made which will increase their facilities for handling goods. In the factory a new engine is being placed in position, so that everything will be in first-class shape for business during the coming year.

E. T. FRAM, Keystone Lock Works, Lancaster, Pa., has bought 187 feet of ground adjoining the present works facing on Park avenue, which gives him all the ground from Jefferson to Shippen streets, and back to Hamilton street. Mr. Fram expects to commence building an extension to his works in the spring.

MILLER LOCK COMPANY of Philadelphia are building an addition to their factory which will increase their facilities 25 per cent. Up to July they had accumulated more stock than usual, but since then the demand has been very large, and although running full time it was only last week that they caught up with their orders.

SHIELDS & BRO., who have been located at 119 and 121 North Third street, Philadelphia, for half a century, are now moving into the large 5 story building 521 Market street, which extends back to Commerce street, a distance of 200 feet. Increasing business demanded more room, hence the removal.

THE GERMANTOWN TOOL WORKS, Philadelphia, have removed from 410 and 412 Commerce street to 518 Commerce street, giving them more commodious quarters.

THE NUBIAN IRON ENAMEL COMPANY, Cragin, Ill., are continually introducing something new. They have added blue lacquer or plow varnish to their list of products, and are pleased to find that it not only gives excellent satisfaction, but that it is meeting with large sales. Their trade in blacks they report the best they ever knew. Up to the 15th inst. their December sales were nearly double those of last December, running them over two carloads behind their orders. The first quarter of their 1893 memorandum calendar is now in press and will be mailed free to all inquirers.

WE ARE ADVISED that the Pike Mfg. Company, Pike Station, N. H., are looking for a chance to locate a factory, where they will employ 50 to 100 men. They would prefer buying an established plant if at a cheap price. They require a building from 80 to 150 feet long by 40 to 70 feet wide; one or two stories high. About 80 horse-power wanted; water power much preferred. It must be where good sharp cutting sand can be procured cheap and located on railroad where cheap freight rates can be had in every direction. Any good building that they could change over so that it would be suitable for their purposes would answer.

IN THEIR ADVERTISEMENT in this issue, the American Whip Company, Westfield, Mass., call special attention to the excellence of their Buggy Whips, which are described as made of selected whip material.

MILLER LOCK COMPANY, Philadelphia, Pa., advise us that they have been exceptionally busy for the last few months and are erecting an addition to their plant.

MEADVILLE VISE COMPANY, Meadville, Pa., have built an addition to their factory 40 x 200 feet. The company have been working 13 hours per day for the past two months, but they report that trade for the last two weeks has fallen off somewhat.

A. GREENAMYER has bought out the interest of his partner, J. B. Callahan, in the Hardware business at Columbiana, Ohio. He will continue it at the old stand.

THE ETTÉ & HENGER MFG. COMPANY, St. Louis, Mo., who manufacture a full and complete line of hardware novelties, plumbers' specialties, &c., have had a remarkably successful year, and their books show a very large increase in the number of customers in comparison with one year since. Several times during the

year they were so pushed to fill orders they were compelled to work overtime. Their business continued to grow, and they were compelled to make additions in the way of new buildings. These are now completed, and this company are able to turn out 8000 pounds of brass castings and 40,000 pounds of iron castings daily. The new addition consists of buildings of one, two and three stories in height. Their foundry, with new cupola, &c., will be in blast on January 3, 1893, and they will then employ something over 300 hands. They report an excellent trade, and state that they are receiving a large number of stock orders for delivery after January 1. They consider the outlook extremely gratifying and anticipate a large spring trade.

GEORGE M. SHIRK of the George M. Shirk Mfg. Company, 112 and 114 Lake street, Chicago, is seriously ill with typhoid fever.

BLAIR MFG. COMPANY, Springfield, Mass., have bought the business of Hills Archimedeon Lawn Mower Company of Hartford, Conn., including patterns, patents, good will, &c., and will continue the manufacture of several of their best specialties. The Archimedeon Horse Lawn Mower, which has been prominently on the market for a number of years, will be specially pushed by the Blair Mfg. Company.

Phoenix Horseshoe Company.

THE PHOENIX HORSESHOE COMPANY of Illinois recently incorporated, Charles S. Miller of Huntington-Hopkins Company, 64 Reade street, New York, president, have located the site for a new plant at Joliet, Ill., where ground was lately broken preparatory to the erection of buildings which in size and dimensions will be an exact duplicate of those at Poughkeepsie, N. Y., now producing the same class of goods and controlled by the same interests. The machinery provided will be of the latest and most approved kinds for the purpose, and capable of much larger output. Horseshoes will be made of both Iron and Steel, taking the material in the pig, resulting finally in a finished article ready for the farrier. There will be two rolling mills and puddling furnaces, all iron, measuring 121 x 124 feet and 116 x 156 feet. A third building, all iron, will be the Horseshoe department, 70 x 200 feet, together with a building for punching, 65 x 150 feet, and a warehouse, 80 x 200 feet, the warehouse and punching department being constructed of stone with iron roofs. All of the roofs will be supported by trusses, leaving the interiors entirely unobstructed. The site is advantageously located on the Elgin, Joliet & Eastern Railway, popularly known as the Belt Line, which intersects every railroad running into and out of Chicago, it having a radius of 50 miles. There are also three trunk lines running near the works, while large fields of bituminous coal are within 15 miles. There is an impression current that this plant will supersede that in Poughkeepsie, which is entirely erroneous, as the Eastern factories will be maintained and operated just as they have been in the past. The Joliet mills expect to be producing goods early in April, 1893.

J. Curley & Brother's Clock.

EVER SINCE J. Curley & Brother moved their cutlery business from their old stand, corner of Nassau and Beekman streets, to 6 Warren street, New York, they have been endeavoring to decide upon some distinctive and appropriate sign for their place of business. This appeared particularly desirable as Warren street is often confused in the minds of people with Murray street, which is the next street south. The need of a landmark was made more apparent to the firm by a customer spending an hour on Murray street looking for Curley's Cutlery store. The result has been a handsome clock, as shown in the accompanying illustration, placed on the sidewalk in front of



Fig. 750.—J. Curley & Brother's Clock.

the store, near the curbing. The clock is a Seth Thomas, with two dials, 30 inches in diameter, and the height of the clock from the sidewalk to the center of the dials is 13 feet 2 inches. The iron work is finished to represent oak corresponding with the interior finish of the store. It was found that the words "Cutlery Store" supplied the required number of letters to take the place of figures on the dials. The address, 6 Warren street, being somewhat obscured by the hands on the dials, has been also painted on the blank space immediately under the

letters T O R. This, with the word Curley's over the top of the clock, as remarked by Mr. Curley, tells the whole story—Curley's Cutlery store, 6 Warren street. It is the practice of this firm to spare no expense when improvements will benefit their business or their customers. This policy is recognized in the elaborate manner in which their establishment is fitted up.

The Holding Power of Nails.

FROM JAMES PENDER & CO., St. John, N. B., we have the following interesting communication with reference to the holding power of Cut as compared with Wire Nails:

In connection with the tests recently made as to the adhesion of Cut and Wire Nails it may be interesting to your readers to know the reason of the greater resistance of the Cut Nail.

In June, 1889, at the Watertown Arsenal the following tests were made by the writer:

1. A Cut Nail whose surface had been made smooth to correspond with a smooth Wire Nail was tested with the Wire Nail of the same denomination. The result was that the Wire Nail showed 20 per cent. greater resistance than the Cut Nail, showing that adhesion depends on the character of surface, not on the form of the Nail.

2. An ordinary Cut Nail was tested against the Wire Nail of same denomination whose surface had been oxidized by simply heating the Nail. Result, the Wire Nail showed about 20 per cent. greater resistance than the Cut Nail, showing that if the Wire Nail is given the same character of surface as the Cut Nail, the Wire Nail has an advantage. The Cut Nail being worked hot the surface is covered with a heavy coating of oxide of Iron.

3. Test was also made of Wire Nail having oxidized surface against Cut Nail on which a point had been made similar to point on the Wire Nail. Result, Cut Nail showed about 10 per cent. greater resistance, the Wire Nail used being 10 per cent. lighter than the Cut Nail. This shows that resistance is not dependent on form of Nail, but directly on amount and character of surface presented.

The certified copy of this test will be forwarded to any one interested, for inspection.

Will also say that result is easily shown by preparing Nails and drawing with a hammer.

Moore & Handley Hardware Company's Catalogues.

MOORE & HANDLEY HARDWARE COMPANY, Birmingham, Ala., issue catalogues No. 1 and 2; the first relating to Carriage Hardware and the second to Mining, Furnace and Railroad Supplies. They consider this method the most desirable, as customers in one department may not be interested in the line of goods in the other. The catalogues are fully illustrated and contain prices, tables and other matter of interest in their respective lines. In addition to an alphabetical index is a partial list of the goods carried in stock, to aid the purchaser in making up orders. A full page illustration of the stores occupied by the firm is given near the front of the catalogue.

Exports.

THE FOLLOWING are the exports of Hardware, Machinery, Metals and related goods from the port of New York to foreign countries for the week ended December 10, 1892. The items for Canada and Mexico include merchandise by sea-going vessels only. The totals following each port or country represent the value of all exports except specie:

ANTWERP. —Total, \$205,250.	
Organ..... \$38	Electric Material..... \$65
Rubber Goods..... 45	Carriage Parts..... 1,200
Crucibles..... 210	Mineral Fiber..... 1,002
Machinery..... 256	
ALEXANDRIA. —Total, \$509.	
AMSTERDAM. —Total, \$56,769.	
Hardware..... \$369	Agricult. Impits..... \$37
Iron Safe..... 200	Manufd Wood..... 3
ADEN. —Total, \$1,812.	
AYR.	
Machinery..... \$395	
ABERDEEN. —Total, \$125.	
ALEXANDRETTA. —Total, \$68.	
BRITISH EAST INDIES. —Total, \$117,862.	
Clocks..... \$2,773	Lamp Goods..... \$350
Sewing Machines..... 902	Agricult. Impits..... 40
Carts..... 80	
BORDEAUX. —Total, \$1,170	
BRITISH GUIANA. —Total, \$24,178.	
Slates..... \$160	Hardware..... \$272
Manufd Wood..... 12	Tinware..... 126
Lamp Goods..... 56	Stencils..... 14
Plated Ware..... 35	Clocks..... 72
Sewing Machines..... 25	Twine..... 48
Woodware..... 84	Carriage Material..... 434
	Showcases..... 16
BERGEN. —Total, \$275.	
BRISTOL. —Total, \$268,837.	
Manufd Wood..... \$407	Spelter..... \$3,750
Shoe Tacks..... 275	Yellow-Metal Sheathing..... 793
BRAZIL. —Total, \$56,528.	
Silx..... \$70	Nails..... \$415
Manufd Iron..... 5,375	
BARCELONA. —Total, \$9,946.	
India Rubber..... \$300	Crucibles..... \$40
Machinery..... 4,500	Hardware..... 185
BRITISH WEST INDIES. —Total, \$142,267.	
Hardware..... \$296	Coal..... \$1,240
Manufd Iron..... 2,572	Carriages..... 690
Lamp Goods..... 335	Manufd Wood..... 829
Nails..... 428	Twine..... 333
Needles..... 36	Tinware..... 145
Steel Braces..... 408	Cutlery..... 7
Wheelbarrows..... 180	Engineering Instruments..... 180
Trunks..... 104	Slates..... 125
Carriage Material..... 340	Electric Material..... 250
Bird Cages..... 40	Beltng..... 64
Firearms..... 95	Rubber Goods..... 313
Coolers..... 87	Nails..... 17
Woodware..... 77	Perambulators..... 20
Clocks..... 193	Icebox..... 17
Brushes..... 16	Plated Ware..... 130
Sandpaper..... 56	Agricult. Impits..... 75
Scales..... 75	Tacks..... 19
Ice-Cream Freezers..... 37	Engraving Implements..... 300
Windmills..... 75	Railroad Matl..... 9
Machinery..... 43	Wheels..... 57
Sewing Machines..... 12	Silver Ware..... 155
Cart..... 6	Refrigerator..... 78
Hose..... 26	
BRUSSELS. —Total, \$1,007.	
Pumps..... \$55	
BRADFORD. —Total, \$1,400.	
Machinery. \$200	
BALE.	
Manufactured Iron..... \$40	
BATOU.	
Agricultural Implements..... \$217	
BELFAST. —Total, \$1,364.	
BEYROUT. —Total, \$138.	
BREMEN. —Total, \$150,473.	
Manufd Wood..... \$490	Plated Ware..... \$25
Cash Registers..... 20	Hardware..... 85
Typewriters..... 100	Organ..... 275
BRITISH POSSESSIONS IN AFRICA. Total, \$46,286.	
Agricult. Impits..... \$114	Pumps..... \$50
Manufd Wood..... 2,062	Plated Ware..... 342
Car Wheels..... 225	Wheelbarrows..... 141
Organs..... 370	Hardware..... 685
Cutlery..... 110	Typewriters..... 1,277
Lamp Goods..... 140	Woodware..... 398
Surgical Appliances..... 75	Manufd Iron..... 160
Machinery..... 1,086	Bird Cages..... 80
Carriages..... 2,325	Carriage Material..... 70
Windmills..... 286	Scales..... 70
	Sweepers..... 125

BRITISH HONDURAS.—Total, \$125.

BUDAPEST.

Hardware..... \$290	
BERLIN. —Total, \$641.	
Woodware..... \$125	Machinery..... \$160
Rubber Goods..... 456	

AUSTRALIA.—Total, \$378,365.

Hardware..... \$23,823	Carriage Matl..... \$10,457
Lamp Goods..... 6,805	Sewing Machines..... 3,848
Manufd Iron..... 11,294	Plated Ware..... 889
Brushes..... 577	Saws..... 1,205
Rubber Goods..... 1,672	Clocks..... 2,506
Beltng..... 646	Tacks..... 390
Organs..... 2,014	Scales..... 4,044
Agricult. Impits..... 9,605	Nails..... 1,056
Machinery..... 18,437	Woodware..... 5,177
Electric Matl..... 100	Firearms..... 9,357
Tinware..... 687	Pins..... 19
Pumps..... 1,253	Bird Cages..... 187
Agate Ware..... 192	Cutlery..... 308
Velocipedes..... 629	Whetstones..... 10
Wheelbarrows..... 192	Store Trucks..... 130
Carriages..... 2,575	Wringers..... 312
Carriages..... 860	Wagons..... 598
Gun Primers..... 471	Percussion Caps..... 20
Carriage Shells..... 12	Typewriters..... 779
Carriages..... 1,805	Slates..... 550
Slates..... 3,463	Skewers..... 60
Typewriter Supplies..... 95	Showcases..... 10
Brass Goods..... 10	Sandpaper..... 25
Tricycles..... 280	Eyelets..... 10
Razor Straps..... 24	Wheels and Axles..... 316
Metal Polish..... 105	Shot..... 12
Grindstones..... 70	Trunks..... 950
Metal Goods..... 404	Freezers..... 300
Pumps..... 1,238	Nails..... 473
Manufd Wood..... 7,010	Sweepers..... 86

COLOGNE.—Total, \$175.

CENTRAL AMERICA.—Total, \$17,431.

Manufd Iron..... \$1,881	Hardware..... \$531
Iron Pipe..... 525	Electric Goods..... 2,939
Rubber Goods..... 70	Railroad Material..... 4,900
Nails..... 12	Firearms..... 10
Sewing Machine Parts..... 17	Iron Tank..... 70
Packing..... 19	Cutlery..... 224
Steel..... 14	Brushes..... 137
Saws..... 8	Sewing Machines..... 191
Plumbing Goods..... 30	Clocks..... 10
Machinery..... 150	Manufd Steel..... 322

CARDIFF.—Total, \$1,600.

CORK.

Agricultural Implements..... \$427	
CANADA. —Total, \$31,654.	
Manufd Wood..... \$10	Quicksilver..... \$29
Manufd Metal..... 43	

CHAM.

Brass Goods..... \$1,200	
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CADIZ.

Agricultural Implements..... \$10	
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CHILL.—Total, \$2,369.

Machinery..... \$68	Cart..... \$300
Hardware..... 220	Electric Goods..... 40
Cutlery..... 52	Plated Ware..... 1,001
Firearms..... 310	Cartridges..... 103

CATANIA.—Total, \$15.

CHRISTIANIA.—Total, \$225.

CHARKOW.

Agricultural Implements..... \$2,100	
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CANNES.—Total, \$63.

CUBA.—Total, \$584,153.

Hardware..... \$12,330	Telegraphic Matl..... \$67
Manufd Wood..... 2,209	Cutlery..... 4,238
Lamp Goods..... 811	Woodware..... 322
Machinery..... 20,298	Locomotive Material..... 199
Scales..... 2,641	Railroad Cars..... 19,613
Rubber Goods..... 790	Brass Goods..... 64
Steel Rails..... 12,289	Sugar Wagons..... 4,477
Car Material..... 1,183	Windmills..... 476
Copper Goods..... 17	Blowers..... 513
Tacks..... 130	Hoops..... 150
Barrows..... 32	Coal..... 2,444
Steel Plates..... 953	Houses..... 8,300
Valves..... 277	Turntable..... 1,000
Sewing Machines..... 80	Roofing Material..... 50
R. R. Velocipedes..... 150	Clocks..... 123
Electric Material..... 3,086	Boiler Tubes..... 150
Lathe..... 775	Sugar Cars..... 2,050
Bellows..... 107	Pumps..... 3,136
Railroad Material..... 22,689	Iron Safes..... 778
Hose..... 150	Locomotives..... 15,996
Nails..... 1,615	Packing..... 72
Twine..... 60	Lubricators..... 40
Brass Cloth..... 423	Beltng..... 265
Spikes..... 1,653	Tanks..... 620
Wire Goods..... 61	Bicycles..... 128
Brushes..... 108	Iron..... 551
Iron Pipe..... 2,147	Dies..... 192
Powder..... 14	Carriage..... 83
Wringers..... 9	Grindstones..... 135
Wire Nets..... 112	Wood'ng Matl..... 700
Brass Tubes..... 266	Agricult. Impits..... 4,902
Trunk..... 20	Gear Wheel..... 400
Nails..... 42	Crucibles..... 95
Saws..... 46	India Rubber..... 250
Cars..... 3,876	Plated Ware..... 639
Tinware..... 58	Fuse..... 9
Velocipedes..... 115	Emery Cloth..... 93
Tricycles..... 167	Sugar Cars..... 576
Pins..... 45	Iron..... 200
Sheet Iron..... 85	Sanitary Supplies..... 190
Gas Works Matl..... 1,240	Trucks..... 15
Manufd Iron..... 28,249	

CHINA.—Total, \$240,678.

Organ..... \$390	Cartridges..... \$20
Clocks..... 2,749	Lamp Goods..... 236
Hardware..... 363	Sewing Machines..... 384
Nails..... 282	Rubber Goods..... 60

CHRISTIANIA.—Total, \$25,721.

Pumps..... \$90	Clocks..... \$22
Manufd Wood..... 193	Rubber Goods..... 290
Manufd Iron..... 34	Agricult. Impits..... 232
Tinware..... 45	Hardware..... 279
Britannia Ware..... 55	Wringers..... 52

COPENHAGEN.—Total, \$82,934.

Typewriters..... \$385	Wringers..... \$66
Hardware..... 285	Whetstones..... 30
Emery..... 175	Rubber Goods..... 15
Radiators..... 307	Clocks..... 483
Agricult. Impits..... 60	

DUBLIN.—Total, \$445.

Hardware..... \$265	
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DANTZIC.—Total, \$22,996.

DOVER.—Total, \$129,063.

Scales..... \$33	
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DEPTFORD.—Total, \$103,399.

DUNDEE.—Total, \$4,000.

Gas Fixtures..... \$148	
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DRONHEIM.—Total, \$2,280.

DUTCH EAST INDIES.—Total, \$502.

Firearms..... \$125	Cartridges..... \$65
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DUTCH GUIANA.—Total, \$128.

DRESDEN.—Total, \$900.

DANISH WEST INDIES.—Total, \$34,965.

Manufd Wood..... \$12	Hardware..... \$136
Machinery..... 3,379	Manufd Iron..... 41
Manufd Steel..... 6	Lamp Goods..... 58
Rubber Goods..... 19	Iron..... 81
Packing..... 14	Carriage..... 83
Nails..... 67	Slates..... 3
Trunks..... 20	Carriage Material..... 36
Woodware..... 4	Pumps..... 158
Sugar Wagon..... 20	

ECUADOR.—Total, \$3,646.

Manufd Iron..... \$214	Scales..... \$42
Machinery..... 12	Manufd Copper..... 3

DUTCH WEST INDIES.—Total, \$38,401.

Iron Pipes..... \$60	Hardware..... \$211
Woodware..... 117	Manufd Wood..... 78
Water Closet..... 7	Trunks..... 1,079
Carriages..... 532	Clocks..... 124
Coal..... 7	Scales..... 57
Cartridges..... 2	Firearms..... 7
Nails..... 18	Twine..... 38
Plated Ware..... 38	Yellow Metal..... 54
Tinware..... 56	Wringers..... 8
Brass Goods..... 28	Plumbers' Matl..... 34
Nails..... 43	Rubber Goods..... 42
Ornaments..... 18	Carriage Matl..... 36
Pipes..... 14	Iron Safe..... 13
Organ..... 60	Stocks and Dies..... 25
Electric Matl..... 30	Sewing Machines..... 38
Pumps..... 4	Velocipedes..... 21
Lamp Goods..... 22	Manufd Iron..... 48

FRENCH WEST INDIES.—Total, \$81,614.

Lamp Goods..... \$209	Coal..... \$24
Woodware..... 19	Carriage matl..... 89
Sewing Machines..... 62	Carriages..... 280
Iron bars..... 45	Hardware..... 2
Carts..... 432	Wheels..... 25
Freezers..... 28	Plated Ware..... 42
Agricult. Impits..... 87	Clocks..... 30
Water Coolers..... 9	Baby Carriages..... 18
Velocipedes..... 30	Wagon Matl..... 300
Manufd. Wood..... 16	Trunks..... 69

FLORENCE.—Total, \$100.

FRANKFORT.

Tacks..... \$401	
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FRENCH POSSESSIONS IN AFRICA.—Total, \$4,080.

GLASGOW.—Total, \$388,001.

Sewing Machines..... \$130	Oxide Zinc..... \$481
Manufd. Wood..... 1,107	Handle Stuff..... 600
Hardware..... 1,284	Rubber Scraps..... 982
Trunks..... 10	Lead..... 4,870
Manufd. Iron..... 150	Lamp Goods..... 124
Scythe stones..... 510	Bells..... 50
Zinc skin..... 40	Beltng..... 520
Clocks..... 176	Water Wheel..... 200

GENOA.—Total, \$146,320.

Brass Goods..... \$110	Hardware..... \$149
Agricult. Impits..... 263	Machinery..... 800

GIBRALTAR.—Total, \$25,326.

Firearms..... \$1,426	Scales..... \$38
Gun Covers..... 257	

GOTTENBURG.—Total, \$12,324.

GRESTEMUNDE.—Total, \$147.

HAVRE.—Total, \$248,054.

Carriage..... \$450	Sewing Machines..... \$900
Manufd. Iron..... 50	Machinery..... 3,191
Lamp Goods..... 325	Hardware..... 1,548
India Rubber..... 447	Plated Ware..... 40
Agricult. Impits..... 971	Sandpaper..... 50
Typewriters..... 1,846	Rubber Goods..... 1,416
Hooks and Eyes..... 900	Silver Ware..... 300
Copper..... 27,541	Electrical Matl..... 635
Nickel..... 1,293	Copper..... 2,974
Crucibles..... 25	Freezers..... 100
Manufd. Wood..... 5	

HONG KONG.—Total, \$7,215.

Manufd. Wood..	\$100	Firearms.....	\$207
Cartridges.....	51	Organs.....	75
Clocks.....	3,214	Typewriters.....	80
Agricult. Impls..	15	Lamp Goods.....	618
Bird Cages.....	30		

HAMBURG.—Total, \$283,901.

Pumps.....	\$205	Bicycles.....	\$110
Electrical Matl..	16,650	Typewriters.....	1,650
Hardware.....	2,955	Agricult. Impls..	511
Wringers.....	1,017	Babbitt Metal..	794
Minerals.....	57	Manufd. Wood..	651
Tinware.....	32	Woodware.....	66
Clocks.....	46	Plated Ware.....	66
Platinum.....	11,000	Firearms.....	756
Min. Fiber.....	191	Machinery.....	299
Britannia Ware..	165	Whetstones.....	75
Manufd. Iron.....	26	Sewing Machines..	13,158
Silver Ware.....	250	Emery.....	5
Copper.....	672	Razor Straps.....	55
India Rubber.....	15,160	Rubber Goods.....	730

HULL.—Total, \$338,913.

Manufd. Wood..	\$330	Hardware.....	\$1,955
Wringers.....	27	Machinery.....	638
Organ.....	2,500	Slates.....	1,037
Iron Safe.....	50		

HAYTI.—Total, \$65,464.

Hardware.....	\$290	Nails.....	\$160
Lamp Goods.....	16	Plated Ware.....	16
Manufd. Steel..	30	Tinware.....	20
Machinery.....	14	Scales.....	164
Trunk Matl.....	8	Carriage Material	29
Velocipedes.....	2	Clocks.....	5
Agricult. Impls..	27	Axles.....	40
Manufd. Iron.....	48	Manufd. Wood..	13

JAPAN.—Total, \$15,689.

Organs.....	\$186	Belting.....	\$635
Cartridges.....	22	Bicycles.....	135
Sporting Goods..	30	Rubber Goods.....	238
Manufd. Iron.....	899	Hardware.....	276
Clocks.....	753	Instruments.....	989

LISBON.—Total, \$35,300.

LEITH.—Total, \$45,000.

LIMERICK.—Total, \$65.

LEEDS.—Total, \$50.

LONDONDERRY.—Total, \$15.

LEGHORN.—Total, \$45,089.

Sewing Machines..	\$1,250		
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LEIPSI.—Total, \$385.

Rubber Goods ..	\$191		
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LIVERPOOL.—Total, \$1,339,373.

Manufd. Wood..	\$1,056	Emery.....	\$140
Ore.....	2,140	Clocks.....	2,375
Metal Goods.....	5	Hardware.....	4,704
Watches.....	20	Organs.....	4,425
Still.....	27	Machinery.....	2,070
Sewing Machines..	10,170	Agricult. Impls..	85
Electric Belts.....	1,050	Electrical Matl..	300
Woodware.....	20	Typewriters.....	7,400
Emery Wheels.....	75	Cutlery.....	450
Cash Registers.....	105	Wringers.....	55
Wagon.....	150	Emery Wheels.....	156
Sandpaper.....	63	Rubber Goods.....	620
Freezers.....	5	Iron.....	30
Silver Ware.....	94	Organ Material..	190
Copper Matte.....	38,000		

LONDON.—Total, \$1,096,489.

Slates.....	\$125	Sewing Machines..	\$7,200
Organ Matl.....	29	Agricult. Impls..	170
Rubber Goods.....	150	Windmills.....	1,500
India Rubber.....	6,896	Manufd. Wood..	4,438
Shells.....	100	Wagon.....	400
Machinery.....	7,512	Hardware.....	5,199
Firearms.....	100	Manufd. Iron.....	10
Tinware.....	16	Organs.....	945
Lamp Goods.....	510	Electrical Matl..	2,305
Metal Goods.....	80	Woodware.....	5,900
Grindstones.....	1,100	Pumps.....	90
Emery Wheels.....	147	Plated Ware.....	163
Bell.....	16	Typewriters.....	4,068
Saws.....	159	Gas Fixtures.....	60
Scales.....	204	Clocks.....	1,617
Wringers.....	490	Rubber Scraps ..	300
Shot.....	60		

MALTA.—Total, \$610.

MOSCOW.

Agricult. Impls..	\$4,798		
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MADRID.—Total, \$315.

MEXICO.—Total, \$67,105.

Hardware.....	\$2,502	Brushes.....	\$10
Manufd. Iron.....	12,373	Brake Fixtures..	1,100
Lamp Goods.....	212	Mercury.....	30
Pumps.....	600	Manufd. Wood..	88
Machinery.....	1,772	Quicksilver.....	3,475
Electric Material.	220	Percussion Caps.	50
Nails.....	742	Cutlery.....	863
Agricult. Impls..	287	Tin Plate.....	90
Grindstones.....	38	Baby Carriage ..	10
Rubber Goods.....	133	Brass Goods.....	70
Washers.....	240	Valves.....	30
Twine.....	8	Manufd. Copper..	234
Cartridges.....	20	Zinc.....	25
Sandpaper.....	200	Tacks.....	220
Clocks.....	980	Pulleys.....	20
Spikes.....	582	Manufd. Steel..	40
Iron Pipe.....	2,610	Carriage Material	50
Tinware.....	25	Bicycles.....	386
Water Cooler.....	8	Roller Skates.....	45
Velocipedes.....	19	Emery Wheel.....	51
Scales.....	106	Hose.....	45
India Rubber.....	12	Iron Tubes.....	300

MANNHEIM.—Total, \$183.

MALMO.—Total, \$44.

MARSEILLES.—Total, \$77,751.

Machinery.....	\$623		
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NAPLES.—Total, \$136,380.

Lamp Goods.....	\$177	Agricult. Impls..	\$70
Sporting Goods..	15	Metal Goods.....	260
Machinery.....	173		

NEW BRUNSWICK.—Total, \$7,879.

Coal.....	\$6,920		
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NANTES.—Total, \$500.

NORFOLK.—Total, \$50.

NEWFOUNDLAND.—Total, \$2,000.

NEWCASTLE.—Total, \$74,938.

Machinery.....	\$3,230	Tinware.....	\$400
Manufd. Wood..	1,949		

NEW ZEALAND.—Total, \$55,411.

Carriage Material	\$2,302	Carriage.....	\$202
Woodware.....	2,594	Grindstone Flts.	32
Lamp Goods.....	2,169	Machinery.....	44
Tinware.....	10	Agricult. Impls..	742
Scales.....	250	Hardware.....	8,763
Cartridges.....	156	Wringers.....	1,071
Organs.....	920	Clocks.....	1,424
Firearms.....	80	Cutlery.....	257
Brushes.....	21	Manufd. Iron.....	1,333
Nails.....	370	Rubber Goods.....	50
Sandpaper.....	30	Axles.....	367
Manufd. Wood..	1,355	Belting.....	25
Sewing Machines..	285	Carts.....	104
Trucks.....	18	Nails.....	236
Carpet Sweepers..	10	Stocks and Dies..	140
Saws.....	15	Trunks.....	29
Fuse.....	34	Pumps.....	361
Razor Straps.....	26	Plated Ware.....	74
Sash Cord.....	96		

NOVA SCOTIA.—Total, \$83.

Hardware.....	\$15		
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Oporto.—Total, \$13,500.

PORTUGUESE POSSESSIONS IN AFRICA.

Agricultural Implements.....	\$573		
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PERU.—Total, \$8,006.

Hardware.....	\$37	Belting.....	\$37
Lamp Goods.....	69	Musical Instruments	28
Cash Register.....	60	Cutlery.....	17
Firearms.....	547	Electrical Goods..	75
Woodware.....	61		

PHILIPPINES.—Total, \$922.

Lamp Goods.....	\$284	Hardware.....	\$40
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RIGA.

Agricultural Implements.....	\$72		
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ROTTERDAM.—Total, \$230,762.

Wringers.....	\$253	Scales.....	\$417
Hardware.....	52	Copper.....	11,700
Whetstones.....	24	Agricult. Impls..	60
Pumps.....	185	Sweepers.....	110
Woodware.....	110	Copper.....	3,150

STETTIN.—Total, \$97,227.

STOCKHOLM.—Total, \$1,046.

Machinery.....	\$100	Organ Material..	\$245
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SPANISH POSSESSIONS IN AFRICA.—Total, \$10,138.

SCHOENENWERD.—Total, \$350.

ST. PETERSBURG.—Total, \$30.

SAN DOMINGO.—Total, \$31,351.

Manufd. Iron.....	\$141	Tinware.....	225
Sewing Machines..	285	Trunk Material..	79
Rubber Goods.....	70	Nails.....	395
Cutlery.....	380	Cartridges.....	27
Firearms.....	70	Manufd. Steel ..	13
Machinery.....	142	Sandpaper.....	24
Scales.....	51	Tacks.....	4
Brushes.....	42	Instruments.....	37
Trunk Material..	67	Agricult. Impls..	60
Wheels and Axles..	130	Organ.....	50
Coal.....	25	Woodware.....	11
Grindstone.....	18	Lead Pipe.....	15
Packing.....	30	Needles.....	9
Twine.....	84	Wire Goods.....	13
Hardware.....	1,062	Pumps.....	20
Manufd. Wood..	8	Carriage.....	100
Lamp Goods.....	95		

TRIESTE.—Total, \$1,155.

TASMANIA.—Total, \$444.

TUNIS.

Woodware.....	\$380		
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Agricultural Implements.....	\$64		
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UNITED STATES OF COLOMBIA.—Total, \$22,730.

Manufd. Iron.....	\$1,844	Lamp Goods.....	\$287
Cutlery.....	589	Hardware.....	725
Sewing Machines..	179	Clocks.....	21
Velocipedes.....	3	Electrical Goods..	7
Typewriters.....	71	Woodware.....	52
Tinware.....	126	Shot.....	47
Cartridges.....	47	Needles.....	12
Percussion Caps..	1	Firearms.....	66
Twine.....	35	Rubber Goods.....	186
Packing.....	130	Scales.....	50
Agricult. Impls..	25	Manufd. Copper..	20
Isinglass.....	85	Shot.....	40

VENICE.—Total, \$3,450.

Machinery.....	\$150		
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VENEZUELA.—Total, \$119,770.

Manufd. Wood..	\$15	Hardware.....	\$1,910
Lamp Goods.....	36	Manufd. Iron.....	2,214
Machinery.....	1,434	Sewing Machines..	2,004
Nails.....	277	Iron Safe.....	125
Clocks.....	19	Cutlery.....	277
Coal.....	670	Saws.....	4
Blocks.....	29	Woodware.....	44
Tacks.....	205	Twine.....	260
Grindstones.....	18	Mfs. of Copper.....	376
Water Closets.....	48	Scales.....	316
Springs.....	12	Trunks.....	12
Rubber Goods.....	158	Casters.....	14
Tinware.....	2	Electrical Matl..	222
Sandpaper.....	87	Solder.....	8
Packing.....	147	Brass Goods.....	27
Saw Teeth.....	70	Carts.....	57
Pumps.....	84		

WATERFORD.—Total, \$21,919.

ZURICH.—Total, \$1,235.

Organs.....	\$440	Typewriters.....	\$796
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Grand total \$7,948,532

It Is Reported--

That S. W. Crane's Hardware store at Blendeve, Mo., was burglarized on the 10th inst. The thieves secured a few Revolvers and Pocket Knives.

That the name of the Springfield Hardware Company, Springfield, Mo., has been changed to the McGregor-Noe Hardware Company.

That the partnership between C. Thysell and Joseph P. Porter in the Hardware business at Hawley, Minn., will be dissolved January 1, 1893.

That William Goodes and Stephen R. Hall, Jr., have purchased the Agricultural Implement stock of John Van Tine, Flint, Mich., and will continue the business at the old stand. In addition to Implements the new firm will handle Buggies.

That George Ryan of the Hardware firm of Bowles & Ryan, Emden, Ill., has sold out his interest to Mr. Bowles, who will continue the business alone.

That the Hardware store of Williams & Hopkins, Wilmington, Del., was robbed on the 11th inst. A large quantity of Silver Knives, Spoons and Forks was carried off.

That the Hardware store of Walter & Mears, Rochester, N. Y., was damaged by fire on the 10th inst. Loss, \$100.

That W. H. Goodfellow & Son, Hardware merchants, Hollidaysburg, Pa., have disposed of their business to the Goodfellow-Melvin Company.

That Gould & Mitchell have recently entered the Hardware business at Philadelphia, Pa.

That E. E. Terwilliger, Hardware dealer at Woodford, Wis., has been succeeded by Frank E. Trees.

That A. R. Hicks' Hardware store at Palmyra, N. Y., was entered by burglars on the 6th inst., and Knives, Scissors and Cutlery stolen.

That Fred. G. Burney of the Hardware firm of Burney Bros., Little Falls, N. Y., was married on the 7th inst. to Miss Lillie McIlhaemy at the residence of the bride's parents in Brooklyn.

That Heinsohn Bros., Hardware dealers, Mount Vernon, N. Y., have enlarged their store.

That burglars entered the Hardware store of Victor Born & Bros., Chicago, Ill., on the 7th inst., and carried off \$200 worth of Arms and Ammunition.

That Hunter & Co., Reading, Pa., have taken possession of their new Stove store.

That N. C. Dixon & Co. have recently opened a Hardware store and Tin shop in Hyde Park, Vt.

That a new Hardware firm at Humboldt, Iowa, is Wilson & Winn.

That Danville, Ill., has a new Hardware store conducted by W. B. Rickey.

That Hoppe & Dusch, Hardware dealers at Echo, Minn., have been succeeded by George Hoppe.

That Rillington & Benham, Hardware dealers, Morgan, Minn., have dissolved.

That J. Herbert Seavey has had some extensive repairs made on his Hardware store at Dover, N. H., and it is now one of the most attractive in the State.

That C. Smith has disposed of his interest in the Hardware firm of A. H. Smith & Co., Fairmont, Minn.

That the Hardware and Stove store of S. H. Shattuck & Son, Raymond, N. H., was destroyed by fire recently. Loss, \$9000; insurance, \$6000.

That J. L. Derby's Hardware store at Cranford, N. J. was destroyed by fire a short time since.

That Perry Hyde, Harrisburg, Ore., has disposed of his Hardware business to O. Hyde.

That the Hardware store of T. R. Young & Co., Reedsburg, Wis., was burglarized on the 28th ult., the thieves securing about \$200 worth of Knives and Razors.

That T. J. Dunsheath, formerly with Case & Uehren, Hardware merchants, Aurora, Ill., has purchased Joseph Fulton's interest in the Hardware store of Fulton & Kennedy. Mr. Fulton retires from business, for the present at least, on account of ill health.

That the Jewell Hardware & Implement Company have been chartered at Jewell City, Kan.

That William H. Dennis' Hardware store at Milton, Pa., was burglarized a short time since.

That H. A. Parmenter & Son, Marshalltown, Iowa, have sold their Hardware stock and building to C. C. Hillman.

That the Hardware firm of Grist & Woodard, Dearborn, Mo., has been dissolved, Mr. Woodard retiring. Mr. Grist has purchased his interest and will continue the business.

Ice Tools.

JOSEPH A. BOGARDUS, who is successor to Bogardus, Ellaby & Ellsworth, 167 Chambers street, New York, continues to represent Wm. T. Wood & Co. as their agent, and carries in stock as heretofore a full line of their well-known Ice Tools. We are advised by him that the trade in this class of tools is increasing rapidly, and that although the output is increased each year to provide for the greater demand, the supply is sometimes short of the requirements. More of these goods are being marketed through the retail Hardware trade each season, but the reason so many merchants fail in getting their orders promptly filled is because they wait until the ice harvesting season is upon them before sending in their orders. He suggests that a small assortment be carried by the retailer at first, of Tongs, Bars, Saws, Hooks and Axes, and that as customers become aware that there are such goods manufactured, and where they can be obtained, the demand will increase from year to year. Such articles as Markers, Plows, Planes, Grapples, Hoisting Gins, Scrapers, &c., run into more money and can be ordered as required. It is equally true of Ice Tools as of other goods, that to sell them they must be seen.

CHARLES W. JACOBS is carrying on the business formerly conducted by his father, J. J. Jacobs, Windsor, N. C., who died last summer.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

All branches of the trade have been quiet the past week and no new features of interest have developed outside of the negotiations between White Lead and Linseed Oil manufacturing interests. As to the outcome it is doubtful that anything will be made public until after the holidays, and whether the corrodors will make any revision in list prices for White Lead is also likely to remain in suspense in the interval. In the position of the markets for base materials there is no perceptible change, and, with nothing more than very commonplace variations in cost, prices for nearly all manufactured goods remain almost stationary.

White Lead.—The market is devoid of new feature. The smaller manufacturers of pure pigment are moving cautiously, pending information as to what changes, if any, will be made in the National Lead Company's list, and producers of various mixtures of the better class are quite as backward about departing from the lines upon which their business has been conducted for some time past. Hence business at present is confined almost wholly to filling ordinary small orders, and the bulk of the latter go to jobbers, since the latter interest still part with moderate quantities at prices somewhat below the corrodors' official list.

Red Lead and Litharge.—Reference was made to fair sales of Glass makers' Litharge for delivery during the early part of next year at about current prices. Otherwise it does not appear that anything more than a retail business has been effected, and the general situation is much the same as usual at this season of the year.

Orange Mineral.—Some few purchases of foreign have been made at prices that look very favorable to the buyer when contrasted with the popular quotations. Such transactions cut no really important figure, however, and the bulk of the moderate business passing is at old prices.

Zincs.—Orders for domestic Oxide do not appear to have been as numerous the past week as they were, yet the volume of business would appear sufficient to prevent friction between manufacturers, and the old line of prices is adhered to. In foreign brands the movement is very slow at present, but despite that fact and the inroads making by American manufacturers of high-grade Zinc, prices remain without change.

Colors, &c.—The market is bare of distinctly new feature. Bulk goods for Grinders' use fare as well as they usually do at this season of the year, as far as sales are concerned, and the transactions reflect no important movement in values. On Dry and Oil Colors for painters prices remain stationary and business in that line and in various prepared Paints is momentarily rather slow.

Miscellaneous.—A fair quantity of Block Chalk has been received, but the market is not visibly affected, former prices being asked. Whiting and Paris White bring previous figures, but are selling in a moderate way only. Business in the general line of Clays is moderate, with prices showing scarcely any fluctuation.

Animal and Vegetable Oils.

The most striking features have been in the departments that monopolized attention to a great extent last week, but while these have afforded a certain amount of interest, and served to break in upon the usual holiday season monotony, it does not appear that anything very remarkable has been achieved. The negotiations toward amalgamating the Linseed Oil interests

have failed as yet to lead to positive results. The violent fluctuation in the Lard market keeps both buyers and sellers on the alert, but does not appear to have brought about any radical change in prices of Lard Oil or lubricants that come into competition with it. Cotton Seed products have been subjected to "bull" enthusiasm and "bear" pressure, yet 1¢ per gallon will cover the entire movement of prices. Outside of the lines specified nothing has occurred to disturb matters, and business has proceeded in about the usual manner at practically former prices.

Linseed Oil.—While the deal between the National Lead Company and the Linseed Oil producers has been shrouded in mystery, as usual of late where concentration of interests is involved, a most suggestive move has been made in the shape of an advance of 2¢ per gallon in the price of Oil. The crushers are now quoting 48¢ for Raw and 51¢ for Boiled Oil made from domestic seed. Not a particle of evidence come from any quarter that would point to change in the relation of supply and demand as dictating this advance, nor is the condition of the market for crude material such as to necessitate higher figures for Oil. Under the circumstances the tendency is to the opinion that, if a combination has not been actually formed, there is at least a tacit understanding through which competition will be regulated for mutual benefit of Oil producers.

Cotton Seed Oils.—Transactions were again on a quite liberal scale, and the market presented an animated appearance at intervals, with more than faint suggestion of speculative manipulation. Fully 3500 barrels of prime crude changed hands, beginning at 37¢, then dropping to 36¢, and finally moving back to 37¢. About 2500 barrels Summer Yellow changed hands at similarly irregular prices, one sale having been made at 41¢, from which price there was a fall to 38½¢, followed by a reaction to 40¢. Choice butter quality sold at 42¢ to the extent of 700 to 800 barrels. Most reports are to the effect that prospects are very favorable, and that lack of export is more than balanced by increased home consumption due to substitution of compounds for Lard, because of the high cost of the latter.

Lard Oil.—City pressers have kept their price at the one point, and receivers of the moderate supply sent along from outside points did not vary theirs more than 1¢ per gallon, although the market for raw material has again been very irregular. Present prices are relatively very high in comparison with those ruling for other lubricants, and the latter are substituted by consumers to greater or less extent. Still, the distribution of Lard Oil appears to be remarkably good, all things considered, and current production is very closely absorbed.

Fish Oils.—Manufacturers are quoting about 1¢ per gallon higher on pressed and bleached Menhaden Oils, the demand for the goods being fair, while cost in the future promises to be higher, since supplies of crude are comparatively small. Good sales of crude Spermaceti at stiff prices have been made in New Bedford, but there is no change on the manufactured products. Whale, Cod and Herring Oils remain quiet.

Miscellaneous.—Ceylon Coconut Oil has been selling somewhat more freely, chiefly at former prices, but Cochin remains quiet. Olive Oil rather slow, but steady at former prices. Red Oils and Tallow Oil remain firm, with demand fair.

Spirits Turpentine.—Receipts at this point have been large enough to cause some accumulation of supply, and, in the absence of stimulating or even encouraging advices from the South, prices have weakened a little. Sales were made at 30½¢ for regular and 31¢ for machine barrels.

Egg Holder and Egg Tongs.

George E. Fahnestock & Co., Lancaster, Pa., are putting these goods on the market as shown in Figs. 1 and 2. The holder, Fig. 1, contains the egg at the

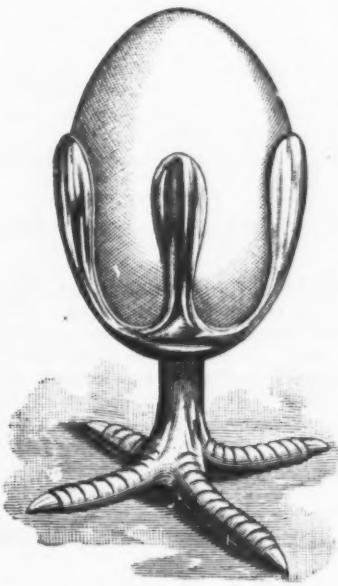


Fig. 1.—Egg Holder.

table, and allows of the upper portion of the shell being removed when preparing it for eating. The tongs are used for taking the egg from the dish and holding it while it is being prepared. The advantages claimed by the makers for these devices are that they obviate burnt fingers, soiled table cloths and napkins. The

it is simple, made of the best material, highly finished, set ready for use, and every one guaranteed to be perfect in every respect.

Squaring Shears for Cutting Corrugated Metals.

The Peck, Stow & Wilcox Company, Southington, Conn., and 27 Chambers



Squaring Shears for Cutting Corrugated Metals.

street, New York, have recently commenced the manufacture of squaring shears for cutting corrugated sheet metals of any description, particularly such as are used for roofing, siding, &c., the

old Keystone colliery at Locus Dale, and thus secure the coal that is in them. A force of carpenters are building sluiceways and making other necessary alterations near the old breaker.

National Post-Hole Digger.

The accompanying cut of post-hole digger represents the latest efforts of Gibbs Mfg.

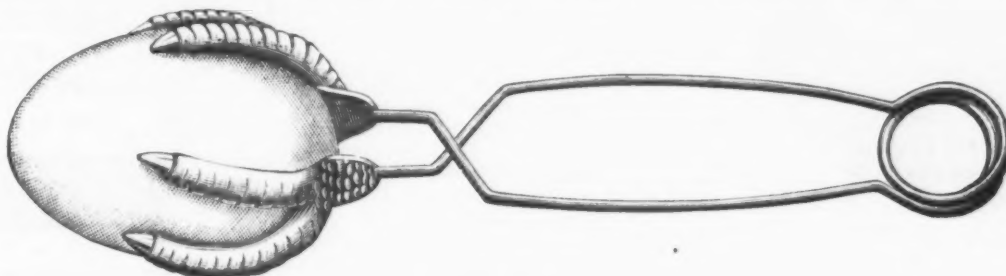


Fig. 2.—Egg Tongs.

goods are nicely finished and attractive in appearance.

The Champion Adjustable and Reversible Spokeshave.

The Champion Safety Lock Company, 74 Frankfort street, Cleveland, Ohio, are manufacturing this tool, as shown in Figs. 1 and 2. The front view is given in Fig. 1

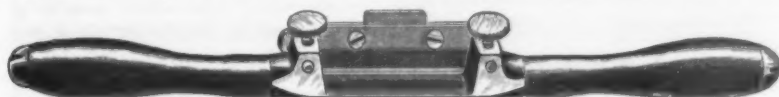


Fig. 1.—Champion Adjustable and Reversible Spokeshave.

and the back in Fig. 2. The manufacturers explain that the blade can be easily

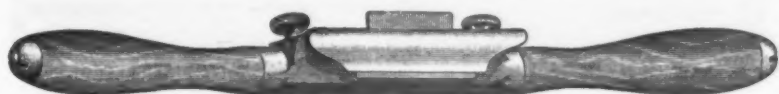


Fig. 2.—Back View of Champion Spokeshave.

adjusted, that it will cut on a flat surface, and when it is reversed from one side to the other will cut on a small curve; that

blades in each instance being made to fit the corrugation intended to be cut. In changing the corrugation it is obvious new blades must be supplied to correspond. So far this application is confined to the heavy No. 0130 squaring shear here illustrated.

Thousands of tons of valuable fuel may be recovered from the culm banks which have long accumulated in the Pennsyl-

is the resting of the handles on the shoulders, bringing the thrust on the blades instead of on the bolts, which, it is claimed,



National Post Hole-Digger.

prevents the handles from splitting. The point is made that the handles are separate and easily grasped, and the material and finish are guaranteed the best.

Coal & Iron people, it is stated, have decided to wash out the immense culm banks that tower mountain high at the

Combined Stove Pipe and Collar Holder, &c.

The accompanying cuts illustrate devices for holding stove pipes, flue stoppers, &c., put on the market by C. C.

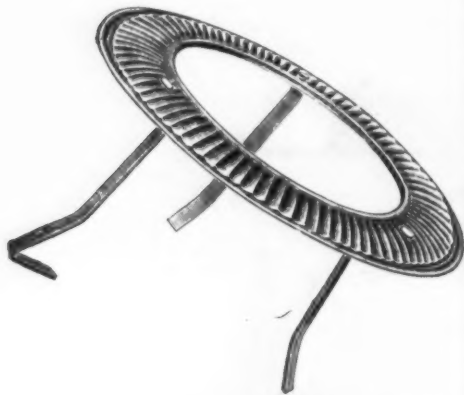


Fig. 1.—Combined Stove Pipe and Collar Holder.

Gregory, Sandwich, Ill. Fig. 1 is a stove pipe and collar holder having springs which extend through the thimble into the chimney. The pipe is pressed in be-



Fig. 2.—Combined Stove Pipe and Collar Holder with Flue Stopper Attached.

tween the springs, which are designed to hold it in place by bearing lightly upon it. The spring turned back prevents the pipe,



Fig. 3.—Combined Stove Pipe and Collar Holder and Flue Reducer.

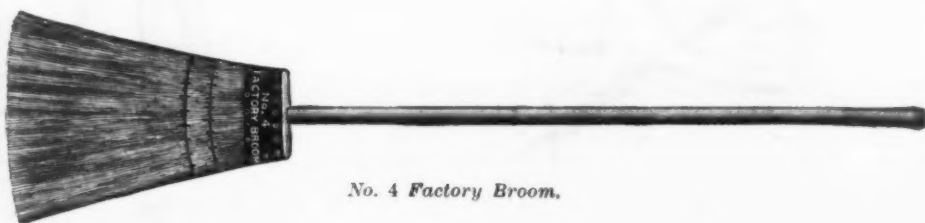
if it be long, from being pushed far enough into the chimney to cut off the draft. The device is intended to hold both pipe and collar securely to the chim-

ney. The point is made that the springs will catch and hold even the shortest end of a pipe. These are furnished in 5, 6 and 7 inch. The stopper, Fig. 2, is attached when the pipe is removed, by taking the collar from chimney and placing the stopper underneath the springs next to collar, where it is held firmly, and the collar replaced in the chimney. These stoppers are referred to as handsomely decorated and an ornament to any room.

The reducer, Fig. 3, is same as the pipe and collar holder, but having two sets of springs, one fitting the flue, the other the pipe. This is designed not only to reduce the flue, but also to hold the pipe perfectly secure. With this, it is stated, a 6-inch pipe can as well be used in a 7 as a 6 inch flue. These springs are all made of spring steel and durable.

No. 4 Factory Broom.

Jos. Lay & Co., Ridgeville, Ind., is offering a rattan mixed broom, as here-

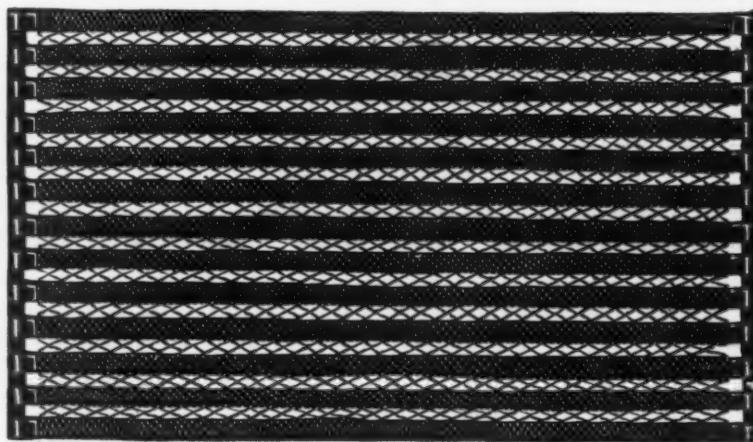


No. 4 Factory Broom.

with shown. The broom is made of broom corn and rattan mixed together, flat in shape, with an iron band, making, it is claimed, a broom solid, substantial and stiff for handling the heaviest dirt, including in its make up lightness and strength.

New Midgley Wire Matting.

The accompanying illustration shows the new Midgley wire matting, manufactured by the Trenton Iron Company, Trenton, N. J. The mats are made of galvanized steel wire, the edges being finished with rubber strips, securely attached by interlocking metal strips. The manufacturers claim that they are the only wire and rubber mats so constructed that they can be rolled up or that will conform themselves to stairs and remain in shape with no fastening other than being tacked to the floor; also, they are the only wire mats into which may be woven ornamental letters as a sign. They can also be pro-



New Midgley Wire Matting.

vided with rubber shoe cleaners, on which the edges of shoes may be thoroughly cleaned, thus avoiding the carrying of dirt or mud indoors. The manufacturers

also recommend them for railroad passenger cars, Pullman cars and street railway cars; for this purpose it is desirable for them to be in two pieces for each car, so that they can be easily handled. In this form it is perfectly easy and safe to roll them up, throw them on the platform or ground, turn water on them and wash them and put them back in the cars. Mats can be lettered, when so desired, with brass or nickel letters.

The standard sizes are 16 x 24, 18 x 30, 22 x 36, 26 x 48, 30 x 48, 36 x 48, 36 x 60, 36 x 72. Irregular shapes, special sizes and extra heavy mats made to order. These goods are also made in brass wire.

The "W" Patent Stake Pocket.

Minnesota Hardware Company, 292 East Seventh street, St. Paul, Minn., are putting this article on the market. An illustration of it is given herewith. The stake pocket is of malleable iron and is intended



The "W" Patent Stake Pocket.

has a long bearing on the stake, thereby holding it firmly, so that it will not wear off or break off easily against the edge of the pocket. The company are also mak-

ing a small casting, the object of which is to prevent the pocket from wearing the sill. The stake pocket is made in sizes from 2½ x 1½ inch to 3 x 1½ inch.

Shears and Rolls.

The two machines shown herewith are being brought out by the Cambridge City Punch, Shear & Roll Company, Cambridge City, Ind. The slitting and squar-



Fig. 1.—No. 1 Slitting and Squaring Shear.

ing shear, Fig. 1, is designed to cut sheet iron, steel or brass to 16 gauge, and is provided with their automatic hold down, and works from the treadle. The machine is provided with rear and front gauges, and is referred to as strong and neat in appearance, and will be guaranteed by the makers to do the work assigned it when properly handled. The manufacturers

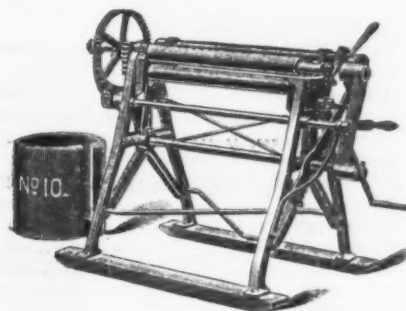


Fig. 2.—Forming Rolls.

state that with their new improvements in slitting shears they can build machines with 16 and 18 throat and guarantee them to cut from 12 to 16 iron or steel, thus giving from 4 to 6 inches additional throat room. The improved quick-adjustable forming rolls, Fig. 2, are made in all sizes for hand or power. The top roll, it is said, remains stationary, not tipping upward. The rolls are self-opening. When the metal has been rolled the post box is pulled off of the top roll with the lever, and the lower gripping roll is dropped, which releases the metal so it can be easily removed. The roll is automatic and is adjusted to the different thicknesses of metal desired to be rolled. The rear or bending roll is provided with segmental arm at each end, the arm being hinged at a point below, and connects with small gears on the shaft above. The shaft is rotated by lever, and the roll is thus moved so as to roll metal any circle wanted. The roll is provided with gear wheels and counter shaft, so as to be easily turned with a crank.

Acoustic Alarm for Oil Cans.

Jno. A. Pollock, Garrison's, N. Y., has devised a whistling device in connection with oil cans to prevent oil overflowing the receiver. A set of tubes and chambers are connected with each other in such a manner that they form an air-tight passage from the end of the spout to the interior of the can. When the oil is poured out air will enter through the tube so as to pro-

duce a whistling noise. When the oil has reached a point so as to cover the end of the air tube the noise will cease and the operator is immediately apprised of the fact that the receptacle is almost full. At the same time the outflow is automatically checked by the stopping of the ingress of air.

Immel's Lightning Drain Cleaner.

The Buckeye Mfg. Company, Union City, Ind., are manufacturing this drain tool, as shown in Fig. 1. It is a hand machine to be used as a shovel. The dirt pan is made of No. 18 steel, 3 inches deep



Fig. 1.—Immel's Lightning Drain Cleaner.

and 12 inches long, with vertical end in the rear. It may be used for dipping water and dirt, for letting down tiling into ditches, and is found convenient and

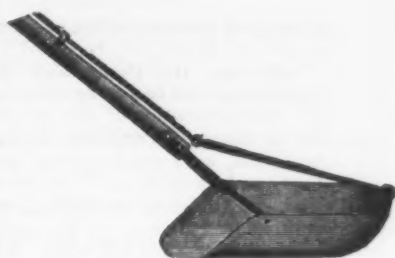


Fig. 2.—Adjusted to Pull.

saves the extra labor of standing and working in muddy ditches. The iron adjusting rod extending up the handle, it is stated, can be used with great rapidity

and ease, and can be adjusted to pull or push, as shown in Figs. 2 and 3, as quickly as the hand can be moved up or down the



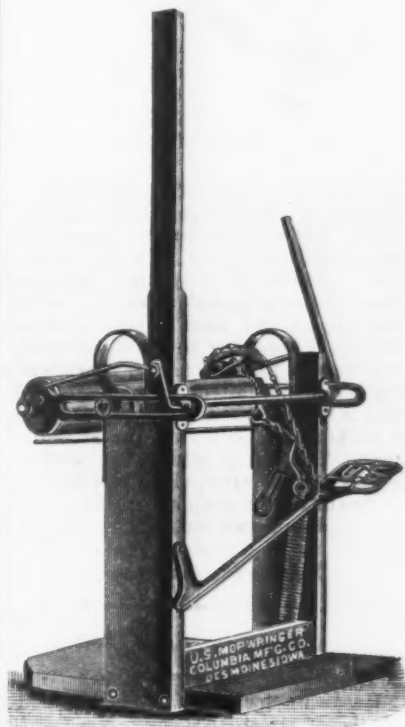
Fig. 3.—Adjusted to Push.

handle. The blade may be held in any position by tightening the screw.

The U. S. Mop Wringer.

The Columbia Mfg. Company have just put upon the market the wringer illustrated in the accompanying cut.

The base of the wringer is 12 x 15 inches, the uprights are 4 x 16 inches, with



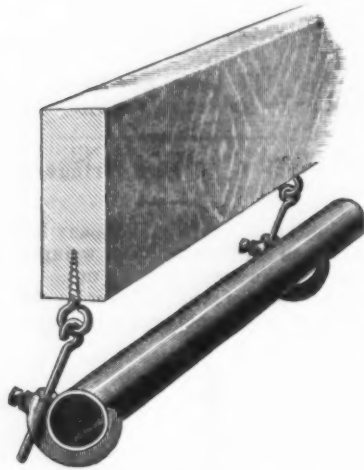
The U. S. Mop Wringer.

a handle or rest extending 15 inches above on the one side, all of hardwood $\frac{3}{4}$ inch stuff. The two wooden rollers are of unequal size, the smaller one is journaled in two oil-tempered springs and is actuated by foot power. The larger roll is journaled to the horizontal slotted bars, which are mounted on the journals of the small roll and on the outer ends of the clamping lever. In use the rolls are separated by throwing the lever forward. The mop is introduced between the rolls and passed into the bucket below, then raised between rolls, and the rolls are brought together by throwing the lever back, when it becomes automatically locked. By pressing the foot upon the treadle a revolution of the small roll is effected; when the pressure is released upon the treadle the coil spring causes the oscillating segment to return to its normal position, ready for a second stroke. The large roll is driven by its contact with the small roll directly or indirectly through the mop. Five strokes of the treadle are

sufficient to drive an ordinary mop between the rolls. Wire guides are provided to prevent the mop cloth passing laterally beyond the rolls. The entire act of wringing a mop can be performed without stooping. Its weight is 17 pounds.

The Globe Adjustable Pipe Hanger.

A form of pipe hanger of interest to the fitter is being introduced to the trade by the Globe Steam Heater Company of North Wales, Pa. The features of this hanger are thoroughly explained by the

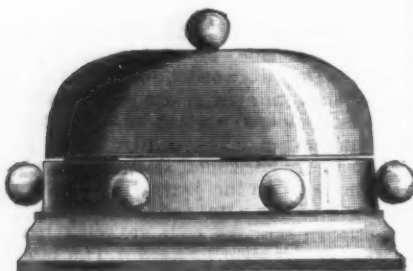


Globe Adjustable Pipe Hanger.

accompanying illustration, which shows a beam with two hangers and a section of pipe. The special features claimed for the device are that it can be easily put on or taken off while the pipe is in position, and, furthermore, adjusted accurately without the use of any tools except a monkey wrench. Referring to the illustration, it will be seen that the hanger consists of an eye screw that fastens in the beam, and to this is hooked a rod which passes through a socket in a hook that fits around the pipe. The rod is held in the socket by means of a set screw, which permits its adjustment in any position. These hangers are made in two lengths, of 7 and 12 inches, and for pipe of any size from $\frac{1}{2}$ inch to 14 inches in diameter.

Revolving Table Bell.

Hardware Specialty Company, 61 and 63 Mulberry street, Newark, N. J., have recently put on the market the bell illustrated herewith. They call attention to



Revolving Table Bell.

the simplicity of its construction, inasmuch as it has no springs or delicate parts and requires no winding. It is finished in nickel plate or quadruple silver plate, as desired, and is furnished in two sizes, 3 and 4 inch.

The main shaft of one of the pumping engines at Ridgewood, Philadelphia, broke last week after doing service since 1869.

Engineer Van Buren recommends that a duplicate plant be ordered, at a cost of about \$510,000.

Mahoning and Shenango Valleys.

The Home Gas Fuel Company of Youngstown have made a proposition to a party of Cincinnati capitalists, who propose to purchase the gas mains in Youngstown and conduct a plant for the manufacture of gas for fuel purposes. At the present time the gentlemen who comprise the new company are arranging for the money with which to build the plant, which will have a capacity for manufacturing 2,000,000 to 3,000,000 feet of gas daily under the Harrie patents, wherein gas is made from coal, oil and steam. Those at the head of the enterprise are determined to work as rapidly as possible, and have the plant in operation within a short time after the transfer of the mains is made.

The Lloyd Booth Company, Youngstown, have just placed an electric-light plant in their works. There are 25 arc lights 1200 candle power. This enterprising concern now have one of the best machine and foundry works in Ohio, and are doing a large business. They have just contracted with the Muncie, Ind., Iron & Steel Company for one 12-inch mill, one 10-inch mill, besides shears, roll lathe and other machinery. They are also at work on the 18-inch bar mill for the Brown-Bonnell Iron Company, Youngstown, and two tin mills, two sheet mills and three cold rolling mills for the Falcon Iron & Nail Company, Niles.

W. B. Pollock & Co. are manufacturing several boilers for a concern in Everett, Washington, and other places along the western coast.

The Youngstown Carriage Works and the Fredonia Mfg. Company are receiving large orders for spring goods. The Youngstown Carriage Company have just completed a large addition to their works.

The Enterprise Boiler Company, Youngstown, are crowded with work. They have recently put in a new 5-ton traveling crane and other appliances for handling heavy plates.

The galvanizing plant of the Falcon Iron & Nail Company, at Niles, which has been running only day turn for quite a period, will start running nights also this week to keep up with the increased orders.

The Wallis Foundry Company, Girard, Ohio, are working on large orders for heavy castings for Union Iron & Steel Company's various rolling mills.

The Youngstown Bridge Company are running full in all departments, having received orders for several bridges in the past few weeks.

The Miller Foundry, Youngstown, is now engaged in turning out chill steel rolls for Reeves Iron Company, Canal Dover, Ohio, as well as general rolling mill castings for local mills.

In speaking of the ventilation of rooms, in a lecture at Liverpool, reported in a foreign exchange, Dr. Parks said that various considerations had to be taken into account. The respiration of the inmates, with the products of artificial lighting and combustion, were the elements to be got rid of, and these replaced by the introduction, in sufficient quantities, and with inappreciable motion, of the purest air that the surroundings afforded. Theoretically, 1000 cubic feet of space was desirable for each inmate, with a supply of 3000 cubic feet of air per hour, which meant a complete replenishing of the internal atmosphere each 20 minutes. Unfortunately, however, in this as in many other respects, theory was often found impracticable. The lowest amount exacted

by law was in canal boats, where 60 cubic feet per head was the minimum allowance. Common lodging houses followed with 250 cubic feet, workhouses 300, barracks 600, prisons 800, and schools 800, the ideal being reached in hospitals with 1000. In hospitals for infectious diseases 2000 cubic feet was often allowed.

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Current Hardware Prices.

DECEMBER 21, 1892.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... \$ doz \$3.00, 33%
Excelior..... \$ doz \$11.00..... 50&10&2%
North's..... list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c**Anvils—**

Eagle Anvils, # 10 15&15%
Peter Wright's..... 11&11%
Arrington's Mouse Hole..... 10%
Am. Wrought, Horse shoe brand, 11&11%
Trenton..... 10%
Wilkinson's..... 10%
Moore & Barnes Mfg. Co..... 33%
Anvil Vise and Drill—

Millers Falls Co., \$18.00..... 20%
Cheney Anvil and Vise..... 25%
Allen Anvil and Vise, \$3.00..... 40&10%
Star..... 45&5%

Apple Parers—See Parers, Apple, &c.**Augers and Bits—**

Douglass Mfg. Co..... 75%
Wm. A. Ives & Co..... 75%
Humphreysville Mfg. Co..... 75%
French, Swift & Co. (F. H. Beecher)
P. S. & W. Co..... 75%
Rockford Bit Company..... 55%
Cook's, Douglass Mfg. Co..... 55%
Cook's, N. H. Copper Co..... 60%
Ives' Circular Lip..... 60%
Patent Solid Head..... 50%
C. E. Jennings & Co., No. 10, extension
Hip..... 40%
C. E. Jennings & Co., No. 30..... 40%
C. E. Jennings & Co., Auger Bits, # set,
3 3/4" quarters, No. 5, \$5; No. 30, \$3.50, 25%
Lewis' Patent Single twist..... 45%
Russell Jennings' Augers and Bits, 25&10%
Imitation Jennings' Bits..... 60&60&10%
Pugh's Black..... 20%
Pugh's Jennings Pattern..... 30%
Car Bits..... 60&60&10%
Car Bits, P. S. & W. Co..... 60&10%
Snell's Car Bits..... 60%
L'Honnemieu Car Bit..... 15&10%
Forster Pat. Auger Bit..... 20%
Cincinnati Bell-Hangers' Bits..... 30&10%

Bit Stock Drills—

Morse Twist Drills..... 50&10&5%
Standard..... 50&10&5%
Cleveland..... 50&10&5%
Syracuse, for metal..... 30&10%
Syracuse, for wood (wood list), 30&30&5%
Cincinnati, for wood..... 30&10%
Cincinnati, for metal..... 45&10%

Expansive Bits—

Clark's small, \$18; large, \$26, 35&35&10%
Ives' No. 4, # doz. \$80..... 40%
Swan's..... 40%
Steer's, No. 1, \$30; No. 2, \$22..... 20%
Stearns' No. 2, \$48..... 20%

Gimlet Bits—

Common..... \$ gross \$2.75@3.25
Diamond..... \$ doz \$1.25..... 40&10%
Bee..... 25&25&5%
Double Cut, Sheppardson's..... 45&45&10%
Double Cut, C. T. Valley Mfg. Co., 30&10%
Double Cut, Hartwell's, # gro..... 35&25%
Double Cut, Douglass's..... 40&10%
Double Cut, Ives..... 60&60&10%

Hollow Augers—

Ives'..... 33%
French, Swift & Co..... 81%
Douglass's..... 50%
Bonney's Adjustable, # doz \$48..... 50%
Stearns'..... 50&5%
Ives' Expansive, each \$4.50..... 50&5%
Universal Expansive, each \$4.50..... 30%
Wood's..... 25&25&10%
Cincinnati Adjustable..... 25&10%
Cincinnati Standard..... 25&10%

Ship Augers and Bits—

L'Honnemieu's..... 15&10&15&10&5%
Watrous..... 25&25&10%
Snell's..... 15&10&15&10&5%
Snell's Ship Auger Pat'n Car Bits,
15&10&15&10&5%

Awl Hafts—See Hafts, Awl.**Awls—**

Awls, Sewing, Common..... \$ gr. 85¢@90¢
Awls, Should. Peg..... \$ gr. \$1.50@1.55
Awls, Pat. Peg..... \$ gr. 35¢@39¢
Awls, Shouldered Brad..... \$ gr. \$1.30@1.40
Awls, Handled Brad..... \$ gr. \$2.50@3.00
Awls, Handled Scratch..... \$ gr. \$4.00@4.50
Awls, Socket Scratch..... \$ doz. \$1.10@1.20

Awl and Tool Sets—See Sets, Awl and Tool.**Axes—**

First quality, best brands, \$7.00..... \$7.50
First qual., other brands..... 6.50 @ 7.00
Second quality..... 5.50 @ 6.00

Axle Grease—See Grease, Axle.**Axles—**

No. 1..... 34¢@44¢, No. 2, 5¢@6¢
No. 7 to 14..... 60&10%
No. 15 to 18..... 47%
No. 19 to 22..... 70%
Concord Axles, loose collar..... 44¢@46¢
Concord Axles, solid collar..... 44¢@46¢
National Tubular Self Oiling..... 34¢@44¢

Bag Holders—See Holders, Bag.**Balances—**

Spring Balances..... 40%
No. 3000 20 30
Chatillon, # doz..... \$0.80 @ 0.95 1.75 net
Chatillon Straight Balances..... 40%
Chatillon Circular Balances..... 50&10%

Barb Wire—See Wire, Barb.**Bars—**

Crow—
Cast Steel..... \$ # 3 3/4¢
Iron, Steel Points..... \$ # 3¢

Basins, Wash—

Standard Fiberglass, No. 1, 10 1/4-inch, #2;
12-inch, \$2.25 13 1/4-inch, \$2.75; 15-inch,
\$3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82, 50&10%
Chatillon's No. 1..... 50&10&5%
Chatillon's No. 2..... 50%
Custer's..... 33%
Beaters—

Egg—

Dover..... \$ doz \$1.20@1.50
Duplex (Standard Co.)..... \$ doz \$1.25
Rival (Standard Co.)..... \$ doz \$1.00
Duplex Extra Heavy (Standard Co.)..... \$ doz \$3.50
Bryant's..... \$ gross \$14.00
Double (H. & R. Mfg. Co.), # gro, No. 0
\$12.00; No. 1, \$15.00; No. 2..... \$26.00
Easy (H. & R. Mfg. Co.)..... \$ gro \$12.00
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50
Spiral..... \$ gro \$4.25 @ \$4.50
Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$9.00
Paine, Diehl & Co.'s..... \$ gro \$24.00
Silver & Co..... \$ doz \$5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2..... 20%

Bells—

Common Wrought..... 60&10%
Western, Sargent's list..... 70&10%
Kentucky, "Star"..... 20&10%
Kentucky, Sargent's list..... 70&10%
Kentucky, Durham..... 70&10%
Dodge, Genuine Kentucky..... 70&10%
Texas Star..... 50&10&50&10&5%

Door—

Gong, Abbe's..... 33%
Gong, Yankee..... 15&10%
Gong, Barton's..... 40&10&50%
Crane, Taylor's..... 25&10%
Crane, Brooks's..... 50&10&2%
Crane, Cone's..... 10%
Crane, Connel's..... 20&10%
Lever, Sargent's..... 60&10%
Lever, Taylor's Japanned..... net
Lever, R. & E. Mfg. Co.'s..... 50&10&2%
Full, Brook's..... 50&10&2%

Electric—

Wollensak's..... 20%
Bigelow & Dowse..... 20%
Taylor's..... 20%

Hand—

Light Brass..... 70&10@70&10&5%
Extra Heavy..... 70%
White..... 70%
Silver Chime..... 33%
Globe Cone's Patent..... 25&10@35%

Miscellaneous

Call..... 45&50%
Farm Bells..... \$ 3¢@3 3/4¢
Steel Alloy Church and School Bells..... 40%

Bellows—

Blacksmiths'..... 60&10@60&10&5%
Molders'..... 40&10@50%
Hand Bellows..... 40&10@50%

Belting, Rubber—

Common Standard..... 70&10@75&5%
Standard..... 70&5@70&10%
Extra..... 60&10@60&10&5%
N.Y.B. & P. Co., Carbon..... 50%
N.Y.B. & P. Co., Diamond..... 50%
N.Y.B. & P. Co., Para..... 40%

Bench Stop—See Stops, Bench**Benders and Upsetters, Tire—**

Stoddard's Lightning Tire Upsetters..... 15%
Detroit Perfected Tire Bender..... 15%
Green River Tire Benders and Upsetters..... 20%

Bits

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.**Blind Adjusters—See Ad-**

justers, Blind.

Blind Fasteners—See Fasteners, Blind.**Blind Staples—See Staples, Blind.****Blocks—**

Cleveland Block Co., Mal. Iron, 50&50&10%
Moore's Novelty, Mal. Iron..... 60%
Sure Grip Steel Tackle Blocks..... 25%

Bolts—**Carriage, Machine, &c.—**

Com. list June 10, '84..... 75&10&5@80%
Genuine Eagle, Norway, list Oct. '84..... 80&80&10%
Phila. pattern, list Oct. 7, '84..... 75&10@80%
R.B. & W., old list..... 70%
Machine, list Jan. 1, 1890..... 80&10%
Bolt Ends, list Jan. 1, 1890..... 80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70&10%
Cast Iron Shutter Bolts..... 70&10%
Cast Iron Chain (Sargent's list)..... 65&10%
Ives' Patent Door Bolts..... 60&10@60&10&5%
Wrought Barrel..... 70&70&10%
Wrought Square..... 70&70&10%
Wrt Shutter, all iron, Stanley's..... 60&10%
Wrt Shutter, Brass Knob..... 40&10%
Wrt Shutter, Sargent's list..... 60&10%
Wrt Sunk Flush, Sargent's list..... 60&10%
Wrt Sunk Flush, Stanley's list..... 50&10%
Wrt B. K. Flush, Co' mr..... 55&10%

Stove and Plow—

Stove..... 60&10@60&10&5%
Plow..... 60&10&50@60&10&10%
R. B. & W., Plow..... 55%

Tire—

Common, list Feb. 28, '83..... 65&65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83..... 65%
Keystone, Philadel., list Oct. '84..... 80%
Norway, Phila., list Oct. '84..... 75%
American Screw Company:
Norway, Phila., list Oct. 16, '84..... 75%
Eagle, Phila., list Oct. 16, '84..... 80%
Philadel., list Oct. 16, '84..... 80%
Bay State, list Feb. 28, '83..... 65%
R. B. & W., Philadel., list Oct. 16, '84..... 80%

Borers, Tap—

Common and Ring..... 20&10%
Ives' Tap Borers..... 35%
Enterprise Mfg. Co..... 20&10@30%
Clark's..... 33%
Borax—

Per lb..... 94¢@104¢

Boring Machines—See Machines, Boring.**Bow Pins—See Pins, Bow.****Boxes, Wagon—**

Per lb..... 24¢

Braces—

American Bit Brace and Tool Co.,
Nos. 10, 12, 20..... 60&10%
Nos. 11, 21, 24, 27..... 70&10%
Nos. 22, 23, 25..... 60&10&5%
Nos. 13, 26, 30, 37..... 70&10&5%
Ball Braces, net..... \$1.12 to \$1.25
Amidon's:
Barker's Imp'd Plain..... 75&10@80%
Barker's Imp. Nickle..... 65&10@70%
Ratchet..... 75&10@80%
Eclipse Ratchet..... 60%
Globe Jawed..... 40&40&10%
Corner Brace..... 40&40&10%
Universal, 8 in., \$2.10; 10 in..... \$2.25
Buffalo Ball..... \$1.10@1.15
Barber's:
Nos. 10 to 16..... 50&10%
Nos. 30 to 35..... 50&10%
Nos. 40 to 63..... 50&10@50&10&10%
Sexton's:
Barker's Imp. Polished..... 75&10@80%
Barker's Imp. Nickle..... 65&10@70%
Ratchet, Polished..... 50&10@60%
Ratchet, Nickle..... 40&10@50%
Buffalo Ball..... net, \$1.10@1.15
Bartholomew's:
Nos. 25, 27 and 30..... 50&10@60&5%
Nos. 117, 118, 119..... 70&70&5%
Common Ball, American..... \$1.00@1.10
Fray's Genuine Spotted..... 50&50&50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414
50&10%
Ives' New Haven Novelty..... 70&70&5%
New Haven Ratchet..... 60&50@60&10%
Barber Ratchet..... 60&50@60&10%
Barber's..... 60&5%
Spotted..... 60&50@60&10%
Osgood's Ratchet..... 40&10@50%
P. S. & W. Co., Peck's Patent..... 60%

Brackets—

Shelf, plain..... 6¢@70¢
Regular, list..... 60&10@70&10%
Shelf, fancy..... 70¢@70&10%
Sargent's list..... 70¢@70&10%
Other makes at a wide range of prices.

Bright Wire Goods—See Wire.**Broilers—**

Hens' Self, Inch..... 9 10 9x11
Basting, 1 Per doz..... \$4.50 5.50 6.50
New Haven..... 50%
Wire Goods Co..... 65&10%
Morgan Odorous..... \$ doz. \$12, 5 1/2

Buckets, Well—

Galvanized—
Hill's..... \$ doz. 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad..... \$ doz. 14 qt. \$4.25@4.50
Helwig's Flat Iron Band..... \$3.75
Helwig's Wired Top..... \$ doz \$4.00

Bull Rings—See Rings, Bull.**Butcher's Cleavers—See Cleavers, Butcher's.****Butts—**

Brass—
Wrought Brass..... 80&80&10%
Cast Brass, Tiebout's..... 50%
Cast Brass, Fast..... 33%
Cast Brass, Loose Joint..... 33%
Cast Iron—

Fast Joint, Narrow..... 50&10&5@60%
Fast Joint, Broad..... 50&10@60%
Loose Joint..... 50&10&5@60%
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..... 75&75%
Parliament Butts..... 810%
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned.....
Loose Pin, Acorns, Japanned,
Plated Tips.....

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad..... 75&75%
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
Bronzed Wrought Butts..... 50&50&10%

Calipers—See Compasses.**Calks, Toe—**

Gautier, One Prong, Blunt..... 54¢@66¢
Burke's One Prong, Blunt..... 54¢@66¢
Burke's, Two Prong, Blunt..... 74¢@86¢
Burke's, One Prong, Sharp..... 64¢@77¢

Can Openers—See Openers, Can.**Caps—****Percussion—**

Hicks & Goldmark's and Union Metallic
Cartridge Co..... \$ 1000
F. L. Waterproof, 1-10's..... 35¢@37¢
E. R. Trimmer Edge, 1-10's..... 47¢@50¢
E. B. Grad. Edge, Cent. Fire, 1-10's..... 47¢@50¢
Musket, Waterproof, 1-10's..... 50¢@53¢
G. D..... 27¢@30¢
S. B. Genuine Imported..... 45¢
Eley's E. B..... 66¢@68¢
Eley's D Waterproof, Central Fire..... \$1.00

Primers—

Berdan Primers, \$1.00..... 2%
R. L. Caps (Sturtevant Shells) \$1.00..... 2%
All other Primers, \$1.20..... 2%

Cards—

Watson's Cotton, Wool, Horse and
File, list January 28, 1891..... 25%

Carpet Stretchers—

See Stretchers, Carpet.

Carpet Sweepers—

See Sweepers, Carpet.

Cartridges—

Rim Fire Cartridges..... 50&5&2%
Rim Fire Military..... 15&2%
Cent. Fire, Pistol and Rifle..... 25&25&2%
Cent. Fire, Military and Sporting..... 15&5&3%
Blank Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.
Blank Cartridges, 22 cal., \$1.75..... 2%
Blank Cartridges, 32 cal., \$3.50..... 2%
Primed Shells and Bullets..... 15&5&3%
B. R. Caps, Round Ball, \$1.75..... 2%
B. R. Caps, Con. Ball, Swgd., \$2.00..... 2%

Casters—

Bed..... Brass..... 55¢@55&10%
Plate..... Others..... 60¢@60&10%
Shallow Socket..... 40&10%
Yale Casters, low list..... 45%
Yale, Gem..... 70%
Martin's Patent (Phoenix), 45&10@50&10%
Payson's Anti-friction..... 70¢@70&10%
Payson's Truck..... 60¢@60&10%
Giant Truck Casters..... 35%
Stationary Truck Casters..... 50&50&10%
Socket Truck Casters..... 50&50&10%
Gwinner's Common Senae..... 50%
Gwinner's Hercules..... 50%

Cattle Leaders—

See Leaders, Cattle.

Cement—

Victor Elastic..... 5 ¢ pails \$ 5 ¢

Chain—

Trace, Wagon and Fancy Chains,
List revised Oct. 15, 1892..... 60¢@60&10%
American Coil, in case lots,
3-16 3/4 5-16 3/4 7-16 3/4
\$7.00 5.30 4.45 3.80 3.65 3.20 3.40 3.35
Less than case lots, add 10%
German Coil, list July 12, 1892..... 60¢@60&5%
German Halter Chain, list July 12, 1892..... 60¢@60&5%
Covert Halter..... 60¢@60&5%
Covert Traces..... 55¢@2%
Covert Heel Chain..... 50¢@2%
Onelda Halter Chain..... 60¢@60&5%
Galvanized Pump Chain..... \$ 54¢@6¢
Jack Chain, iron..... 80¢@10%
Jack Chain, Brass..... 60%

Chalk—

White, case lots, \$ gr 50¢; small lots, 52¢
Red, case lots..... \$ gr 67¢; small lots, 72¢
Blue, case lots..... \$ gr 75¢; small lots, 80¢
See also Crayons

Chalk Lines—See Lines.**Chisels—****Socket Framing and Firmer**

P. S. & W.	
New Haven	
Wetherby	
Mix	
Ohio Tool Co.	
Douglas	
Buck Bros.	
Merrill	
L. & J. White	

Tanged and Miscellaneous.

Tanged Firmer	
Butcher's	
Spear & Jackson's	
Buck Bros.	
Cold Chisels	

Chucks—

Beach Pat.	
Morse's Adjustable	
Danbury	
Syracuse, Balz Pat.	
Graham Patent	
Skinner's Patent Chucks	
Combination Lathe Chucks	
Universal Lathe Chucks	
Independent Lathe Chucks	
Drill Chucks	
Union Mfg. Co.	
Victor	
Combination	
Universal	
Independent	

Churns—

Timin Union, each, 5 gal.	
McDermid Star Barrel Churn, each	
6 gal.	
10 gal.	
20 gal.	

Clamps—

R. I. Tool Co.'s Wrought Iron	
Adjustable, Cincinnati	
Adjustable, Hammers	
Adjustable, Stearns	
Stearns' Adjustable Cabinet and Cor-	
ner	
Cabinet, Sargent's	
Carriage Makers', Sargent's	
Carriage Makers', P. S. & W. Co.	
Eberhard Mfg. Co.	
Warner's	
Saw Clamps, see Vises, Saw Filers	
Carpenter's, Cincinnati	

Cleavers, Butchers'—

Bradley	
L. & J. White	
Beatty's	
New Haven Edge Tool Co.'s	
P. S. & W.	
Foster Bros.	
Schulte, Lohoff & Co.	

Clips—

Norway, Axle, 1/4 & 5-10	
2d grade Norway, Axle, 1/4 & 5-10	
Superior Axle Clips	
Norway Spring Bar Clips, 5-10	
Wrought Iron Felloe Clips	
Steel Felloe Clips	
Baker Axle Clips	

Cloth and Netting, Wire—**See Wire, &c.****Cockeyes****Cocks Brass—****Hardware List—See Mills, Coffee.****Coffee Mills—See Mills, Coffee.****Collars, Dog—**

Chapman Mfg. Company	
Medford Fanc Goods Co.	
Embossed, Gift, Pope & Stevens' list	
Leather, Pope & Stevens' list	
Brass, Pope & Stevens' list	

Combs, Curry—

Fitch's	
Rubber, per doz.	
American Curry Comb Co.	
Kohler's Magic Oscillating	
Kohler's Humane	

Compasses, Dividers, &c.

Bemis & Call Co.	
Dividers	
Compasses	
Callipers, Wing and Inside or Outside	
Callipers, Double	
Callipers, Call's Patent Inside	
Excelsior	
J. Stevens & Co.'s	
Starrett's	
Spring Callipers and Dividers	
Combination Dividers	

Coopers' Tools—**See Tools, Coopers'.****Cord—**

Common	
Patent, good quality	
White Cotton Braided, fair	
Common Russia Sash	
Patent Russia Sash	
Cable Laid Italian Sash	
India Cable Laid Sash	
Silver Lake	
A quality, White, 50'	
A quality, Drab, 50'	
B quality, White, 30'	
B quality, Drab, 30'	
Sylvan Spring, Extra Braided, White, 34'	
Sylvan Spring, Extra Braided, Drab, 34'	
Semper Idem, Braided, White	
Egyptian, India Hemp, Braided	
Massachusetts, White	
Samson	
Braided, White Cotton	
Braided, Drab Cotton	
Braided, Italian Hemp	
Braided, Linen	
Tate's Cotton Braided, White	
Ossawa Mills	
Braided, Giant, White	
Braided, Giant, Drab and Fancy	
Braided, Crown, White	
Braided, Crown, Drab and Fancy	

Wire Picture—**Braided or Twisted—See Screws, Cork.****Corkscrews—See Screws, Cork.****Corn Knives and Cutters****—See Knives, Corn.****Crackers, Nut—**

Table (H. & B. Mfg. Co.)	
Blake's Pattern, # doz.	
Turner & Seymour Mfg. Co.	
Acme	
Japanned, # gro.	
Nickel Plated, # gro.	

Cradles—

Grain	
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Crayons—

White Crayons, # gross	
D. M. Stewart Mfg. Co., Metal Work-	
ers', # gross	
D. M. Stewart Mfg. Co., Rolling Mill,	
# gross	

Crow Bars—See Bars, Crow.**Curry Combs—****See Combs, Curry.****Curtain Pins—****See Pins, Curtain.****Cutters—**

Dixon's, # doz.	
Nos. 1 2 3 4	
Woodruff's, # doz.	
Nos. 1 2 3 4	
Hale's Pattern, # doz.	
Nos. 1 2 3 4	
American	
Nos. 1 2 3 4	
Enterprise	
Nos. 1 2 3 4	
Each	
Great American Meat Cutter	
Nos. 1 2 3 4	
Each	
Miles' Challenge	
Nos. 1 2 3 4	
Home No. 1, # doz.	
Draw Cut, each	
Nos. 1 2 3 4	
Beef Shavers (Enterprise)	
Little Giant (P. S. & W. Co.)	
Chadborn's Smoked Beef Cutter	

Tobacco

Champion	
All Iron	
Nashua Lock Co.'s	
Wilson's	
Sargent's	
Acme	

Washer—

Smith's Pat.	
Johnson's	
Penny's	
Appleton's	
Bonney's	
Cincinnati	

Dampers, &c.—

Dampers, Buffalo	
Buffalo Damper Clips	
Crown Damper	
Excelsior	

Diggers, Post Hole, &c.—

Samson	
Fletcher Post Hole Augers	
Eureka Diggers	
Leed's	
Vaughan's Post Hole Auger	
Kohler's Little Giant	
Each	
Kohler's Invincible	
Kohler's New Champion	
Scheidler	
Ryan's Post Hole Diggers	
Cronk's Post Bars	
Gibbs' Post Hole Digger	
Gibbs' National	
Gibbs' Columbia	
Gibbs' Imperial	
Shimer's Hollow Handle	

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Springs—****See Springs, Door.****Drawers.**

Money, # doz.	
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Drawing Knives—**See Knives, Drawing.****Drills and Drill Stocks—**

Blacksmiths'	
Blacksmiths' Self Feeding	
Erast, P. S. & W.	
Breast, Wilson's	
Breast, Millers Falls	
Breast, Bartholomew's	
Ratchet, Merrill's	
Ratchet, Ingersoll's	
Ratchet, Parker's	
Ratchet, Whitney's	
Ratchet, Weston's	
Ratchet, Moore's Triple Action	
Ratchet, Curtis & Curtis	
Whitney's Hand Drill, Plain	
Adjustable	
Wilson's Drill Stocks	
Automatic Boring Tools	
Chicopee Automatic Drill	

Twist Drills—

Cleveland	
Diamond, W. & B.	
Graham's Pat. Groove Shank	
Morse	
New Process	
Standard	
Syracuse (Meta list)	

Drill Bits or Bit Stock—**Drills—See Augers and Bits.****Drill Chucks—See Chucks.****Dripping Pans—****See Pans, Dripping.****Drivers, Screw—**

Douglas Mfg. Co.	
Diston's	
Buck Bros.	
Stanley R. & L. Co.'s	
No. 44, Varnished Handles	
No. 80	
No. 1, Forged Blade	
Nos. 20, 40 and 60	
P. S. & W.	
Knapp & Cowles	
No. 1	
No. 2	
No. 3	
Nos. 4 and 00, Acme and Ideal	
Stearns'	
Gay & Parsons	
Champion	
Clark's Pat.	
Crawford's Adjustable	
Ellrich's Socket and Ratchet	
Allard's Spiral, new list	
Kolb's Common Sense	
Syracuse Screw-Drive Bits	
Screw Driver Bits	
Screw Driver Bits, Parr's	
Fray's Hol. H'dle Sets	
P. D. & Co.'s All Steel	
Cincinnati	
Brace Screw Drivers	
Buck Bros' Screw Driver Bits	
Goodell's Automatic	
Mayhew's Black Handle	
Mayhew's Monarch	
C. T. Williamson Wire Novelty Co.	

Egg Beaters—See Beaters, Egg.**Egg Poachers—****See Poachers, Egg.****Electric Bell Sets—****See Bells, Electric.****Emery—No. 4 to No. 54 to Flour, CF.**

Kegs, # doz.	
1/2 kegs, # doz.	
1/4 kegs, # doz.	
10-P cans, 10	
In case	
10-P cans, less	
than 10	

Enamelled and Tinned Ware—See Ware, Hollow.**Escutcheon Pins—****See Pins, Escutcheon.****Escutcheons—****Door Lock, Same dis. as Door Locks.****Brass Thread****Wood****Expanded Metal—****List No. 5.**

Lathing	
Fencing, Painted Sheets	
Settling, Painted Sheets	
Door Mats, Galvanized	
Window Guards, Painted	
Tree Guards, Painted	

Extractors, Lemon Juice**—See Squeezers, Lemon.****Fasteners, Blind—**

Mackrell's	
Van Sand's Screw Pat.	
Van Sand's Old Pat.	
Austin & Eddy No. 2008	
Security Gravity	
Zimmerman's	

Faucets—

Fenn's	
Bohren's Pat. Rubber Ball	
Fenn's Cork Stops	
Star	
Frany's Pat. Petroleum	
B. & L. Co.	
West's Lock, Open and Shut Key	
Star, Metal Plug, new list	
Lockport, Metal Plug, reduced list	
Metallic Key, Leather Lined	
Cork Lined	
Burnside's Red Cedar	
Burnside's Red Cedar, bbl. lots	
Peerless Best Black Tin Key	
IXL, 1st quality, Cork Lined	
Perfection, Fla. Red Cedar	
Goodenough Cedar	
Boss Metallic Key	
Reliable Cork Lined	
Western Pattern Cork Lined	
Self Measuring	
Enterprise, # doz.	
Lane's # doz.	
Victor	

Felloe Plates—**See Plates, Felloe.****Fifth Wheels—****Derby and Cincinnati****Brewster****Files—Domestic—**

Nicholson Files, Rasps, &c.	
Nicholson (X.F.) Files	
Nicholson's Royal Files (Seconds)	
(extra prices on certain sizes)	
American	
G. & H. Barnett (Black Diamond)	
Arade	
Earle	
Other makers, best brands	
First brands	
Second quality	
Heller's Horse Rasps	
McCaffrey's Horse Rasps	
Chelsea Horse Rasps, Hand Cut	
Arcade Horse Rasps	
Butcher	
Stubs	

Imported—**Butcher****Stubs****Fixtures, Grindstone—****Sargent's Patent****Reading Hardware Co.****P. S. & W. Co.****Fluting Machines—****See Machines, Fluting.****Fluting Scissors—****See Scissors, Fluting.****Fodder Squeezers—****See Squeezers, Fodder.****Forks—****Hay, Manure, &c., Asso. List****Hay, Manure, &c., Phila. List****Plated, see Spoons.****Frames—Saw—****White Vermont****Red, Polished and Varnished****Screen, Window and Door—****Porter's Pat. Window and Door Frame****Warner's Screen Corner Irons****Stearns' Frames and Corners****Cortland****Freezers, Ice Cream—****White Mountain****Granite State****Artic****American****Buffalo Champion****Shepard's Lightning****Gem****Blizzard****Double Action Crown****Crown****Star****Peerless****Giant****Zero****Boss and Pet****Keystone, P. D. & Co., each****Standard****Standard Double Action****Expert****Model****Confectioners' Machine****Fruit and Jelly Presses—****See Presses, Fruit and Jelly.****Fry Pans—See Pans, Fry.****Funnels—****Gersdorff's Perfection, Standard and****Globe****20's; 5 to 10 gro.**

Halters—

Cover's, Rope, Jute.....	60¢10¢10¢25¢
Cover's, Rope, 7-16-in. Jute.....	70¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢
Cover's, Rope, 1/2-in. Hemp.....	50¢25¢

Hammers—**Handled Hammers—**

Maydole's, list Dec. 1, '85.....	25¢10¢35¢
Buffalo Hammer Co.....	50¢10¢
Humason & Beckley.....	50¢10¢
Atha Tool Co.....	50¢10¢
Verree.....	40¢10¢
C. Hammond & Son.....	40¢10¢
Fayette R. Plumb.....	40¢10¢
Artisan's Choice, A. E. Nail.....	40¢10¢
Regular Y. & P. A. E. Nail.....	50¢
Horseshoe Turning Hammers.....	50¢
Other Hammers.....	50¢10¢
Cheney's Claw.....	40¢10¢
Cheney's Machinist's & Riveting.....	40¢10¢
Hartford, Nail Hammers.....	40¢10¢
Hartford, Machinists, &c.....	50¢5¢50¢10¢
Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75.....	30¢10¢
Nelson Tool Works.....	40¢10¢
Warner & Nobles, new list.....	25¢10¢
Peck, Stow & Wilcox.....	40¢10¢50¢
Sargent's.....	40¢10¢10¢

Heavy Hammers and Sledges—

3 lb and under.....	75¢10¢75¢10¢
3 to 5 lb.....	85¢
Over 5 lb.....	85¢
Wilkinson's Smiths.....	10¢5¢11¢5¢

Handcuffs and Leg Irons—

—See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins' No. 1 Loop, Wpr., 28¢; No. 3, 18¢; No. 4, 15¢; No. 5 and No. 4, Reversible, 18¢.	
Champion.....	15¢

Iron, Wrought or Cast—

Door or Thumb.....	1 2 3 4
Per doz.....	\$0.90 1.00 1.08 1.35 1.50
Roggin's Latches.....	50¢10¢10¢
Bronze Iron Drop Latches.....	50¢70¢
Japan Store Door Handles.....	1.02
Plate, 1.10; no plate, 80¢85¢; net	
Barn Door, 5¢ doz 1.40.....	10¢10¢
Chest and Lifting.....	70¢70¢10¢

Wood—

Saw and Plane.....	40¢10¢50¢
Hammer, Hatchet, Axe, &c.....	40¢40¢5¢
Brad A W.....	50¢20¢
Hickory Firmer Chisel, ass'd.....	50¢40¢
Hickory Firmer Chisel, large.....	50¢50¢
Apple Firmer Chisel, ass'd.....	50¢50¢
Apple Firmer Chisel, large.....	50¢50¢
Socket Firmer Chisel, ass'd.....	50¢50¢
Socket Framing Chisel, ass'd.....	50¢50¢
J. B. Smith & Co's Pat File.....	50¢
File, assorted.....	50¢
Auger, assorted.....	50¢
Auger, large.....	50¢
Pat. Auger, Ives.....	30¢10¢
Pat. Auger, Douglass.....	50¢10¢
Pat. Auger, Swan.....	50¢10¢
Hoe, Rake, Shovel, &c.....	60¢60¢5¢

Hangers—

Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England.....	60¢10¢10¢70¢
Samson Steel Anti-Friction.....	55¢
Orleans Steel.....	55¢
Hamilton Wrought Steel Track.....	55¢
U. S. Wood Track.....	60¢10¢
Champion.....	60¢10¢
Rider and Wooster, Medina Mfr. Co's.....	70¢
Climax Anti-Friction.....	55¢
Climax Anti-Friction for Wood Track.....	55¢
Zenith for Wood Track.....	55¢
Reed's Steel Arm.....	50¢
Challenge, Barn Door.....	50¢
Sterling.....	50¢
Victor, No. 1, \$1.50; No. 2, \$1.50; No. 3, \$1.00.....	50¢25¢
Chertree.....	50¢10¢
Kidder's.....	40¢10¢50¢
Boss.....	60¢10¢
Best Anti-Friction.....	60¢10¢
Duplex (Wood Track).....	60¢10¢5¢
Terry's Pat., 5¢ doz pr 4 in. \$10.00; 5 in. \$12.00.....	50¢10¢
Terry's Steel Anti-Friction Leader.....	50¢10¢
Terry's Steel Anti-Friction Ideal.....	50¢10¢
Cronk's Patent, Steel Covered.....	50¢5¢
Wood Track Iron Clad, 7 ft. 10 in.....	50¢

Carrier Steel Anti-Friction—

Architect, 5¢ set \$6.00.....	20¢
Eclipse.....	20¢10¢
Felix, 5¢ set \$4.50.....	20¢
Richards.....	30¢30¢10¢
Lane's New Standard.....	50¢50¢5¢
Lane's Standard.....	50¢50¢50¢10¢
Lane's Parlor.....	40¢
Ball Bearing Door Hanger.....	20¢10¢25¢10¢
Warner's Pat.....	20¢10¢20¢10¢10¢
Stearns' Anti-Friction.....	20¢10¢20¢10¢10¢
Stearns' Challenge.....	25¢10¢25¢10¢10¢
Fauldless.....	40¢40¢5¢
American, per set \$6.00.....	20¢10¢
Rider & Wooster, No. 1, 62¢4¢; No. 2, 75¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Cincinnati.....	25¢10¢
Paragon, Nos. 5, 5¢, 7 and 8.....	20¢10¢
Crecent.....	20¢10¢
Nickel, Steel, Nos. 0, 25¢; 1, 20¢; 2, 15¢.....	20¢10¢
Scranton Anti-Friction Single Strap.....	33¢4¢
Wheel, \$21.00.....	46¢
Star.....	40¢10¢40¢10¢
May.....	50¢50¢50¢10¢
Barry, \$6.00.....	40¢10¢
Interstate.....	50¢
Magic.....	45¢
Pendulum, Payson's.....	40¢
Moody.....	45¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....	
Blood's.....	
Hunt's.....	
Hurd's.....	
Kelly's.....	
Mann's.....	
Peck's.....	
Underhill's.....	40¢ & 10¢
Buffalo Hammer Co.....	50¢5¢
Fayette R. Plumb.....	
C. Hammond & Son.....	
Sargent's & Co.....	
P. S. & W. Co.....	
Ten Eyck Edge Tool Co.....	10¢
Collins.....	
Schulte, Lohoff & Co.....	50¢50¢5¢

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Parker.....	75¢25¢
Huffer.....	50¢
Clark's, Nos. 1, 3, 5, 40 and 50.....	80¢50¢5¢
Clark's Mortise Gravity.....	80¢
Sargent's, Nos. 1, 3, 5, 11, 12, 13, 75¢10¢	
Reading's Gravity.....	75¢10¢75¢10¢5¢
Shepard's.....	
Noiseless.....	75¢10¢
Ningara.....	80¢
Clark's.....	80¢
Clark's Genuine Pattern.....	80¢
O. S. Lull & Porter.....	75¢
Acme, Lull & Porter.....	75¢
Queen City Reversible.....	70¢10¢5¢75¢
Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2, 3, 5.....	75¢10¢25¢
N. Y. Automatic Blind Fixtures, No. 2, for Wood, \$0.00; No. 3, for Brick, \$1.50.....	10¢

Gate Hinges—

Western.....	50¢ doz \$4.20, 60¢ doz \$4.10
N. E.....	50¢ doz \$7.80, 60¢ doz \$7.00
N. E. Reversible.....	50¢ doz \$5.00, 60¢ doz \$4.10
Clark's, Nos. 1, 2, 3.....	60¢10¢5¢
N. Y. State.....	50¢ doz \$12.50, 50¢ doz \$12.50
Automatic.....	50¢ doz \$12.50, 50¢ doz \$12.50
Shepard's.....	60¢10¢5¢

Spring Hinges—

Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co's list.....	
March, 1888.....	20¢
Barker's Double Acting.....	25¢
Union Mfg. Co.....	25¢
Bommar's.....	15¢20¢
Buckman's.....	15¢20¢
Chicago.....	30¢
Bardley's Patent.....	40¢
Acme.....	30¢
U. S.....	25¢10¢
Empire and Crown.....	20¢
Hero and Monarch.....	20¢
American, Gem and Star.....	20¢
Oxford.....	20¢
Royal.....	60¢5¢
Reliable.....	60¢
Champion.....	60¢
No. 25 Unbreakable.....	90¢
J. G. C. Covered, 5¢ gro, \$30.....	50¢5¢
Samson.....	60¢60¢10¢
Wiles, No. 1, 5¢ gro, \$10; No. 2.....	13¢
Devore, No. 1, 5¢ gro.....	13¢
Rex.....	5¢ gro, \$13.00
Freepot.....	5¢ gro, \$12.00

Wrought Iron Hinges—

List February 14, 1891.....	
Strap and T.....	50¢10¢50¢10¢5¢
Corrugated Strap and T.....	50¢10¢5¢
Screw Hook and Eye.....	14 to 12 in. 5¢ 1/2, 4¢
Strap.....	22 to 36 in. 5¢ 1/2, 3¢
Screw Hook and Eye.....	1/2 in. 5¢ 1/2, 4¢
Strap.....	1/2 in. 5¢ 1/2, 4¢

Roller Blind Hinges, Nos. 32 and 34

Roller Blind Hinges, Nos. 32 and 34.....	50¢10¢
Roller Blind Hinges, Nos. 232 and 234.....	55¢10¢
Roller Raised.....	70¢10¢
Plate Hinges (8, 10 & 12 in. 5¢ 1/2, 5¢	
"Providence" over 12 in. 5¢ 1/2, 4¢	

Hoes—

D. & H. Scovill.....	20¢
Lane's Crescent, Planters' Pattern.....	45¢5¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢5¢
Sandusky Tool Co., S. & O. Pat.....	70¢70¢
American, S. & O. Pat.....	5¢
Chattanooga Tool Co., S. & O. Pat.....	60¢
Grub.....	50¢60¢10¢

Handled—

Garden, Mortar, &c.....	70¢70¢5¢2¢
Planter's, Cotton, &c.....	70¢70¢5¢2¢
Warren Hoe.....	60¢60¢5¢
Magic.....	50¢ doz \$4.00

Hog Rings and Rings—

See Rings and Rings—

Hoisting Apparatus—

See Machines, Hoisting.

Hollow-Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat.....	50¢ doz \$18.....60¢
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Bit—

Extension.....	
Barber's, 5¢ doz \$15.00.....	40¢40¢10¢
Ives, 5¢ doz \$20.00.....	60¢5¢60¢10¢
Diagonal.....	50¢ doz \$24.00, 40¢
Angular.....	50¢ doz \$24.00, 40¢5¢

File and Tool—

Balz Pat.....	50¢ doz \$4.00, 25¢
Nicholson File Holders.....	20¢
Dick's Tool Holder.....	20¢

Hooks—**Cast Iron—**

Bird Cage, Sargent's list.....	60¢10¢10¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢10¢

Clothes Line, Reading list

00¢10¢60¢10¢10¢	
Ceiling, Sargent's list.....	55¢10¢10¢
Harness, Reading list.....	55¢10¢55¢10¢10¢
Coat and Hat, Sargent's list.....	55¢10¢60¢10¢

Coat and Hat, Reading.

50¢10¢50¢10¢10¢	
Cotton.....	50¢ doz \$1.25
Cotton Pat. (N. Y. Mallet and Handle Wks.....	30¢
Tassel and Picture, T. & S. Mfg. Co.....	50¢
Wrought Staples, Hooks, &c.....	

Wire—

Wire Coat and Hat, Gem, list April, 1888.....	60¢60¢10¢
Wire Coat and Hat, Miles, list April, 1888.....	50¢50¢10¢
Indestructible Coat and Hat.....	45¢45¢5¢
Wire Coat and Hat, Standard.....	60¢60¢10¢
Handy Hat and Coat.....	50¢10¢60¢
Steady Ceiling Hooks.....	50¢10¢60¢
Belt.....	80¢15¢80¢20¢
Attica, Coat and Hat.....	60¢60¢10¢
Williamson's Bird Cage Hooks, list April, 1892.....	40¢
Bright Wire Goods—See Wire.	

Miscellaneous—

Grass, No. 2, \$2.00; No. 3, \$2.00; No. 4, \$2.25	
Nolin's Grass.....	55¢60¢
Bush.....	55¢60¢
Whitcomb's Patent.....	55¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	60¢10¢10¢
Fish Hooks, American.....	50¢
Bench Hooks—See Bench Stops.	

Horse Nails—See Nails, Horse**Horse Shoes—**

See Shoes, Horse.

Hose, Rubber—

Competition.....	75¢75¢10¢5¢
Standard.....	60¢10¢10¢70¢10¢
Extra.....	60¢60¢10¢
N. Y. B. & P. Co., Para.....	25¢5¢
N. Y. B. & P. Co., Extra.....	40¢40¢5¢
N. Y. B. & P. Co., Dundee.....	50¢10¢60¢

Huskers—

Blair's Adjustable.....	5¢ gr \$8.00
Blair's Adjustable Clipper.....	5¢ gr 7.00
Hubbard's Solid Steel.....	5¢ gr 4.50

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Irons.**Sad—**

From 4 to 10, at factory.....	100 lb.
Self-Heating.....	\$2.30 doz \$2.40
Self-Heating Tailors.....	50¢ doz \$18.00
Mrs. Pott's Irons, list June 1, 1892.....	30¢
Enterprise Self Irons, list June 1, 1892.....	30¢
Crown.....	50¢10¢60¢10¢5¢
Ideal Irons, new list.....	50¢10¢60¢10¢10¢
Salamanca Irons.....	25¢
B. B. Sad Irons, 5¢ doz.....	30¢30¢
Combined Fluter and Sad Iron, 5¢ doz.....	15¢
Fox Reversible Self-Fluter, 5¢ doz.....	\$24.00
Chinese Laundry (N.E. Butt Co.), 3¢ doz.....	15¢
New England.....	5¢ 15¢
Mahony's Troy Pol. Irons.....	25¢
Sensible, list Jan. 91.....	50¢10¢5¢
Sensible Tailors' Irons.....	33¢
National Self-Heating.....	30¢

Soldering—

Soldering Coppers.....	5¢ 10¢21¢
Cover's Adjustable, list Jan. 1, 1896.....	35¢25¢

Pinking—

Pinking Irons, 5¢ doz.....	55¢60¢
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Jack Screws—See Screws.**Jacks, Wagon—**

Daisy.....	33¢4¢
Victor.....	33¢4¢
Lockport.....	40¢

Kettles—

Brass, Spun, Plain, list Jan. 1, '91.....	25¢5¢
Brass, Spun, Pld. W.M. list Jan. 1, '91.....	20¢
Enameled and Tea—See Ware, Hollow.	

Keys—

Lock, Ass'n list Dec. 30, 1886.....	50¢10¢
Eagle, Cabinet, &c.....	33¢4¢2¢
Hotchkiss' Brass Blanks.....	40¢
Hotchkiss' Copper and Tinned.....	40¢
Hotchkiss' Pat. and Cab.....	35¢
Richard Bed Keys.....	50¢ doz \$4.00, 15¢
Wollensak Tinned.....	50¢10¢

Knife Sharpeners—

See Sharpeners, Knife.

Knives—**Butcher, Shoe, &c.**

Wilson's Butcher Knives, list Dec 8, 1890.....	25¢
Ames' Butcher Knives.....	25¢
Foster Bros' Butcher, &c.....	40¢
Jordan's A A Butchers', list.....	net
Nichols' Butcher Knives.....	40¢10¢
W. W. Wilson, Butcher, 6 in. \$2.00; 7 in. \$2.70; 8 in. \$3.90, &c.....	
Ames' Shoe Knives.....	20¢25¢
Ames' Bread Knives, 5¢ doz \$1.50, 15¢ doz \$2.00.....	20¢20¢10¢
Moran's Bread and Bread.....	20¢20¢10¢
Hay and Straw—See Hay Knives.	
Table and Pocket—See Cutlery.	

Corn—

Bradley's.....	10¢
Wadsworth's.....	25¢25¢10¢

Drawing—

Wetherby.....	75¢75¢10¢5¢
P. S. & W.....	75¢75¢10¢5¢
Mix.....	75¢75¢10¢5¢
New Haven.....	75¢75¢10¢5¢
Merrill.....	60¢10¢60¢10¢5¢
Douglas.....	75¢75¢10¢5¢
Watrous.....	15¢10¢25¢

L. & I. J. White.....

Brad

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10
Perkins' Burglar Proof.....60&25
Plate.....33&25
Barnes Mfg. Co.....40&40&10
Yale.....net prices
Delta Flat Key.....30&10
L. & C. Round Key Latches.....33&10
L. & C. Flat Key Latches.....33&10
Romer's Night Latches.....15
Brooklyn Latches.....50&10
Shepardson or U. S.....35
Seed's N. Y. Hasp Lock.....25

Padlocks—

List June 10, 1891.....50&25
Norwich Lock Mfg. Co., old list.....50&25
Yale Lock Mfg. Co.'s.....net prices
Eureka, Eagle Lock Co.....40&25
Romer's Nos. 0 to 91.....30
Romer's Scandinavian, &c., Nos. 100 to 505.....15
A. E. Deltz.....40
Champion Padlocks.....40
Hotchkiss.....30
Star.....60
Horseshoe.....50
Barnes Mfg. Co.....40&40&10
Nock's.....30
Brown's Pat.....25
Scandinavian.....30&40
E. J. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10
Other Nos.....65
Ames Sword Co. up to No. 150.....40
Ames Sword Co. above No. 150.....50
Slaymaker, Barry & Co.....
No. 1010 line.....85&5
No. 41 line.....45&10
No. 61 line.....50&5
No. 21 line.....75

Sash, &c.—

Clark's No. 1, 10; No. 2, 8 gr.....33&4
Ferguson's.....33&5
Victor.....60&10&25
Walker's.....10
Attwell Mfg. Co.....25&33&4
Reading.....60&10&60&10&10
Hammond's Window Springs.....40
Common Sense, Jap'd, Cop'd and Brzd.....
Common Sense, Nickel Plated.....gr \$10.00
Universal.....30
Kempshall's Gravity.....60
Kempshall's Model.....60&60&10
Corbin's Daisy, list Feb. 15, 1890.....70
Payson's Perfect.....60&10&10
Hugunin's Sash Balances.....25&5&25
Hugunin's New Sash Locks.....25&5&25
Stoddard's "Practical".....10
Ives' Patent.....60&10&60&10&5
Fish (Liesche's pat.), No. 100, gr.....50
No. 105, gr.....10
Davis, Bronze, Barnes Mfg. Co.....70
Champion Safety, list January, 1890.....40
Security.....70
Giant, list Jan., 1892.....70&5
Wolcott's.....60&10&5
Monarch.....50

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....gr doz, \$1.75; gr gross.....\$17.50

Machines.

Boring—

Without Augers. Upright. Angular.
Douglas.....\$5.50 \$6.75
Snell's, Rice's Pat.....5.50 6.75 40&10&10
Jennings's.....5.50 6.75 45&10
Other Machines.....2.35 2.75
Phillips' Patent.....
with Auger.....7.00 7.50
Miller's Falls.....7.50 25

Fluting—

Knox, 4 1/2-inch Rolls.....\$3.25 each 35
Knox, 6-inch Rolls.....\$3.00 each 35
Eagle, 3 1/2-inch Rolls.....\$2.15 35
Eagle, 5 1/2-inch Rolls.....\$2.85 35
Crown, 4 in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.....35
Crown Jewel, 6 in.....35
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35
Domestic Fluter.....each, \$1.50
Geneva Hand Fluter, White Metal.....gr doz \$12.25
Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00.....30
Shepard Hand Fluter, No. 85, per doz.....\$15.30 40
Shepard Hand Fluter, No. 110, gr doz.....\$11.00 40
Shepard Hand Fluter No. 95, gr doz.....\$8.00 40
Clark's Hand Fluter, gr doz \$15.00.....35
Combined Fluter and Sad Iron.....gr doz \$15.00.....30
Buffalo, gr doz \$10.00.....10

Hoisting—

Moore's Hand Hoist, with Lock Brake.....20
Moore's Differential Pulley Block.....40
Energy's Mfg. Co.'s.....25
Sure Grip Steel Tackle Blocks.....25

Washing—

Anthony Wayne, gr doz, No. 1, \$51; No. 2, \$45; No. 3, \$42
Western Star, gr doz, No. 2, \$45; No. 2 \$48
Wellsell.....gr doz \$54.00
Fair and Square.....gr doz \$42.00

Mallets—

Hickory.....20&10&20&10&10
Lignumvite.....20&10&20&10&10
B. & L. Block Co., Hickory & L. V.....30&30&10

Mattocks—Regular list.

60&10&60&10&5

Measures—

standard Fiberglass, No. 1, peck gr dozen, \$4; 1/2 peck, \$3.50.

Meat Cutters—

See Cutters, Meat.

Menders, Harness—

Per doz.....\$2.00

Mills—

Coffee—

Box and Side, list Jan. 1, 1888, 60&60&10
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co.....30
The Swift, Lane Bros.....30

Mining Knives—

See Knives, Mining.

Molasses Cates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Philadelphia.....60&10
Pennsylvania and Continental.....60
New Model and Excelsior.....60&60&10
Other Machines.....60&10&10&75

Muzzles—

Safety.....gr doz, \$3.00, 25

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92, 80&10&10&5
Tack Mfrs' list.....70&5&70&10
Wire Nails, Standard Penny.
Card, Apr. 11, '92 base.....\$1.80&\$1.85
Hungarian, Finishing, &c. See Packs.

Horse—

Nos. 6 7 8 9 10
American.....84 84 84 84 84 .net
Ausable.....28 26 25 24 23
Clinton, Fin.....19 17 16 15 14 30&10
Essex.....28 26 25 24 23
Lyra.....19 17 16 15 14 40&10
Snowden.....19 17 16 15 14 40&10
Vulcan.....23 21 20 19 18
Northwest'n.....25 23 22 21 20
A. C.....25 23 22 21 20
C. B. K.....25 23 22 21 20
Maud S.....25 23 22 21 20
Champlain.....28 26 25 24 23
Saranac.....23 21 20 19 18
Champion.....25 23 22 21 20
Capewell.....19 17 16 15 14 10&5
Anchor.....23 21 20 19 18 35
Western.....23 21 20 19 18 50
Empire Bronze.....13&14 50
Picture—
Brass Head, Sargent's list.....60&60&10
Brass Head, Combination list.....50&10
Porcelain Head, Sargent's list.....50&10
Porcelain Head, Combination list.....40&10
Niles' Patent.....40

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Hot Pressed.....5.00
Cold Funched.....5.00
In packages of 100 lb, add 1-10¢ gr lb, net; in packages less than 100 lb, add 1¢ gr lb, net.
Oakum—
Best or Government.....gr doz \$7.40
U. S. Navy.....gr doz \$5.00
Navy.....gr doz \$5.00
Oilers—
Zinc and Tin.....65&10&70&5
Brass and Copper.....65&10&70&5
Malleable, Hammers' Improved, No. 1, \$3.80; No. 2, \$4.00; No. 3, \$4.40 gr doz.....10&10&5
Malleable, Hammers' Old Pattern, same list.....45
Prior's Pat. or "Paragon" Brass.....60&10&10
Prior's Pat. or "Paragon" Zinc.....50
Olmstead's Tin and Zinc.....60
Broughton's Brass and Copper.....60
Broughton's Zinc.....60
Broughton's Brass.....50
Gem, F. D. & Co.....gr doz \$7.00
Steel, Draper & Williams.....50

Openers, Can—

Messenger's Comet.....gr doz \$3.00, 25
American.....gr gross \$2.75&\$3.00
Duplex.....gr doz 25, 15&20
Lyman's.....gr doz \$3.75, 20
No. 4, French.....gr doz \$2.25, 50&60
No. 5, Iron Handle.....gr doz \$6.00, 45&60
Eureka.....gr doz \$2.50, 10
Sardine Sissors.....gr doz \$2.75, 30
Star.....gr doz \$2.75
Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50; 4, \$2.75; 5, \$3.00
Excelsior, No. 1 \$2.50; No. 2, \$1.50.....40
World's Best, gr gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50&10
Universal, gr doz \$3.00.....55&5
Domestic, gr doz \$2.00.....45
Champion, gr doz \$2.00.....50

Packing, Steam—

Rubber—

Standard.....70&70&10
Extra.....60&60&5
N. Y. B. & P. Co., Standard.....50
N. Y. B. & P. Co., Empire.....60
N. Y. B. & P. Co., Salamander.....25
Jenkins' Standard, gr 80¢.....25&25&5
Miscellaneous—
American Packing.....10¢&11¢ gr lb
Russia Packing.....14¢ gr lb
Italian Packing.....13¢&14¢ gr lb
Cotton Packing.....15¢&17¢ gr lb
Jute.....7¢&8¢ gr lb

Pails—

Galvanized—

Quarts 10 12 14
Hill's Light Weight, gr doz, \$2.75 3.00 3.25
Hill's Heavy Weight, gr dz, 3.00 3.25 3.75
Hilwig's.....2.50 2.75 3.00
Sidney Shepard & Co.....2.35 2.55 3.05
Iron Clad.....2.50 2.75 3.00
Fire Buckets.....2.75 3.25 3.50
Buckets—See Well Buckets.

Indurated Fiber Ware—25¢

Star Pails, 12 qt.....gr doz \$5.40
Stable and Milk, 14 qt.....gr doz \$3.00
Fire Pails, deep.....gr doz \$5.40
Fire Pails, round bottom.....gr doz \$7.80

Standard Fiber Ware—

Water Pails, 12 qt., gr doz, \$4.00 \$4.50
Dairy Pails, 14 qt., gr doz, 4.50 5.00
Fire Pails, No. 1, 12 qt., gr doz, 4.50 5.00
Fire Pails, No. 2, 14 qt., gr doz, 5.00 6.50
Sugar Pails.....6.00 6.50
Horse Pails.....5.00
Buggy Pails.....4.00
Slop Jars (bal. trap).....8.00 9.00
Chamber Pails, 14 qt.....6.50 7.50

Pans—

Dripping—

Small sizes.....gr doz \$6.40
Large sizes.....gr doz \$5.40
Silver & Co. (Covered).....40

Fry—

Standard List:
No.....0 1 2 3 4
gr doz, \$3.00 \$3.75 \$4.25 4.75 \$5.25
No.....5 6 7 8 9
gr doz, \$6.00 \$7.00 \$8.00 \$9.00
Polished, regular goods.....75&75&10
Acme Fry Pans.....60&5

Dust—

Steel Edge, No. 1.....gr doz \$1.75

Paper and Cloth—

Sand and Emery—

List April 19, 1888.....50&10&50&10&5
Sibley's Emery and Crocus Cloth.....30

Parers—

Apple—

Advance.....gr doz \$4.75
Baldwin.....gr doz 5.25
Bonanza.....each 5.00
Daisy.....gr doz 4.00
Dandy.....each 7.50
Eureka.....gr doz 4.25
Family Bay State.....gr doz 12.00
Favorite.....gr doz 5.00
Gold Medal.....gr doz 4.00
Ideal.....gr doz 4.00
Improved Bay State.....gr doz 27.00&30.00
Little Star.....gr doz 4.50
Monarch.....gr doz 13.50
New Lightning.....gr doz 5.50
Oriole.....gr doz 4.00
Penn.....gr doz 4.00
Perfection.....gr doz 4.00
Pomona.....gr doz 4.00
Rocking Table.....gr doz 6.00
Turn Table.....gr doz 4.50
Victor.....gr doz 13.50
Waverly.....gr doz 4.00
White Mountain.....gr doz 4.00
72.....gr doz 4.25
78.....gr doz 7.00

Potato—

White Mountain.....gr doz \$4.50
Antrim Combination.....gr doz \$5.50
Hoosier.....gr doz \$13.50
Saratoga.....gr doz \$5.50

Pencils—

Faber's Carpenters'.....high list 50¢
Faber's Round Gilt.....gr \$5.25
Dixon's Lead.....gr \$4.50
Dixon's Lumber.....gr \$6.75
Dixon's Carpenters'.....10

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60&10&60&10&5

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10
Sargent & Co.'s, \$17 and \$18.....60&10
Peck, Stow & W. Co.....50&10&50&10&5

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885, 50&10&50&10&5
Brass.....60&60&5

Pipe, Wrought Iron—

List October 12, 1892.
1 1/2 and under, Plain.....55&55&10
1 1/2 and under, Galv.....45&45&10
1 1/2 and over, Plain.....65&65&10
1 1/2 and over, Galv.....55&55&10
Boiler Tubes, list Oct. 24, 1892.....65
Casing, list Nov. 16, 1892.....52
Inserted Joints Casing, list Nov. 16, 1892.....47
Steel Boiler Tubes.....27
Cold Drawn Seamless Steel Tubing.....50

Planes and Plane Irons—

Wood Planes—

Molding.....40&10&40&10&10
Bench, First quality.....50&10
Bench, Second quality.....55&10
Bailey's (Stanley R. & L. Co.).....50&10

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10
Miscellaneous Planes (Stanley R. & L. Co.).....25&10
Deers' Iron Planes.....40&10
Meriden Nail Iron Co.'s.....40&40&10
Stearns' Iron Planes.....40&40&10
Birmingham Plane Co.....50&50&10
Gage Tool Co.'s Self-Setting.....20&10&10
Chaplin's Iron Planes.....40&40&10
Sargent's.....60
Standard Tool Co.....50&50&5

Plane Irons—

Butcher's.....\$5.00&\$5.25 to \$5
Buck Bros.....30
Auburn Thistle.....30&10
Ohio.....30&10
Sandusky.....25
L. & I. J. White.....50&10
Stanley R. & L. Co.....50&10

Plates—

Felloe.....gr doz \$6.00&6.40

Pliers and Nippers—

Button's Patent.....60
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 gr doz.....40
Humason & Beckley Mfg. Co.....50&50&10
Lindsay's Giant.....33&4
Gas Pliers, Custar's Nickel Plated.....60&5
Eureka Pliers and Nippers.....40
Russell's Parallel.....25
P. S. & W. Cast Steel.....60
P. S. & W. Timmers' Cutting Nippers, add 6¢.....30
Carew's Pat. Wire Cutters.....20
Morrill's Parallel, gr doz, \$12.00.....30&5
Cronk's 5 in., \$15.00; 10 in., \$21.00.....50&50&5
Cronk's Button Pattern.....50&10&60
Cronk's Carrier Pliers.....60&60&5

Plumbs and Levels—

Regular List.....75&10&75&10&5
Stanley's Duplex.....20&10
Stanley's Handy.....20&10
Disston's.....50
Pocket Levels.....70&10&70&10&10
Davis Iron Levels.....30
Davis' Inclometers.....10&10

Poachers, Egg—

Buffalo Steam Egg Poachers, gr doz, No. 1, \$6.00; No. 2, \$9.00.....25
Silver & Co., 6-Ring, gr doz, \$4.00; 3-Ring.....\$2.00

Pokes, Animal—

Bishop's I. X. L.....gr doz \$6.00
Bishop's O. K.....gr doz \$5.25
Bishop's Pioneer.....gr doz \$3.75
Bishop's American.....gr doz \$2.75
Eagle, Double Stale.....gr doz \$5.75
Eagle, Single Stale.....gr doz \$3.75
Buckeye, Single Stale.....gr doz \$2.75
Bolding.....gr doz \$6.00

Police Goods—

R. I. Tool Co., Handcuffs, \$15.00 gr doz 10¢
R. I. Tool Co., Leg Irons, \$25.00 gr doz 10¢
Tower's.....25
Daley's Improved Handcuffs; 2 Hands, Polished, gr doz, \$48.00; Nickle, \$57.00; 3 hands, Polished, gr doz, \$72.00; Nickle, \$84.00.....25
J. P. Lovell's Police Goods.....25

Polish—

Metal—

Prestoline.....30
Prestoline Paste.....35
Gaston's Silver Compound.....35

Stove—

Joseph Dixon's.....gr gro, \$6.00, 10¢
Gem.....gr gro, \$4.50, 10¢
Gold Medal.....gr gro, \$6.00, 25¢
Lustro.....gr gro, \$4.75
Ruby.....gr gro, \$3.75
Rising Sun, 5 gro lots.....gr \$5.50
Dixon's Plumbago.....gr \$13.00
Boynton's Noon Day.....gr \$13.00
Parlor Pride Stove Enamel, gr Yates' Liquid, 2 3 5 10 gal.....gr gal., \$0.80, 70, 60, 50
Yates Standard Paste Polish, 10 cans.....gr \$12.40
Jet Black.....gr \$3.50
Japanese.....gr \$3.50
Fireside.....gr \$2.50
Diamond O. K. Enamel.....gr \$19.00
Bonnell's Liquid Stove Polish, gr \$9.00
Bonnell's Paste Stove Polish, gr \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....12
Black Jack Water Paste, 5 and 10 lb cans.....12
Nickel Plate Paste.....gr \$6.00
Crown Paste.....gr \$7.50
Crown Paste in 5 and 10 lb pails, gr 12¢
Black Flag.....gr \$7.50
Black Flag, 5 and 10 lb pails, gr 12¢
Black Flag, liquid, in bottles, gr \$8.00
Diamond Rock Nickel Cleaner.....gr \$10.20

Raven Paste:

5-lb. pails, (per case of 6 or 12), gr 12¢
Less than case.....gr 15¢
Liquid, 6 oz. bottles.....gr gross, \$9.00
Liquid, 8 oz. bottles.....gr gross, \$9.00
Water Polish.....gr gross, \$5.85

Poppers, Corn—

Round or Square, 1 qt., gr \$10.00&10.50
Round or Square, 1 1/2 qt., gr \$15.00&15.50
Round or Square, 2 qt., gr \$18.50&19.00

Post Hole and Tree Augers and Diggers—

See Diggers, Post Hole, &c.

Potato Parers—

See Parers, Potato.

Pots—

Glue—

Tinned.....40&10&40&10&5
Enamelled.....40&10&40&10&5
Family, Howe's "Eureka".....40
Family, L. F. C.'s "Handy".....50

Powder—

In Canisters—

Fine Sporting, 1 lb each.....\$0.90
Duck, 1 lb each......60
Rifle, 1 lb each......50
Rifle, 1/2 lb each......18
Rifle, 1/4 lb each......13

In Kegs—

Rifle, 25 lb kegs.....\$4.00
Rifle, 12 1/2 lb kegs.....2.25
Rifle, 6 1/2 lb kegs.....1.25
Duck, 25 lb kegs.....5.00
Duck, 12 1/2 lb kegs.....2.75
Duck, 6 1/2 lb kegs.....1.50

Presses—**Fruit and Jelly—**

Enterprise Mfg. Co. 30%
Henis 1000 1000 1000 1000
Shepard's Queen City 40%
Silver & Co. 20% doz \$2.75

Pruning Hooks and Shears—See Shears.**Pullers, Nail—**

Scranton 1000 1000 1000 1000
Curtis Hammer 1000 1000 1000 1000
Giant, No. 1 1000 1000 1000 1000
Giant, No. 2 1000 1000 1000 1000
Pelican 1000 1000 1000 1000
Eclipse 1000 1000 1000 1000
Economy 1000 1000 1000 1000

Pulleys—

Hot House, Awning, &c. 60% 70%
Japanned Screw 60% 70%
Japanned Side 60% 70%
Japanned Clothes Line 60% 70%
Empire Sash Pulley 55% 60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, 5 in. Swivel, \$1.50 50% 100% 100% 100%
Hay Fork, "Anti-Friction," 5 in. solid, \$1.70 50%
Hay Fork, "P" Common and Patent Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Shade Rack 45%
Tackle Blocks—See Blocks 45%
Moore's Anti-Friction 5 in. Wheel, 40%
doz., \$12.00 40%

Pumps—

Cistern, Best Makers 60% 60% 100%
Pitcher Spout, Best Makers 67% 70%
Pitcher Spout, Cheaper G'ds. 75% 75% 100%

Punches—

Saddler's or Drive, good 60% 60%
Bemis & Call Co.'s Cast Steel Drive 50% 55%
Bemis & Call Co.'s Springfield Socket 50% 55%
Spring, good quality 60% 60%
Spring, Leach's Pat 60% 60%
Bemis & Call Co.'s Spring and Check 40%
Solid Timmers, P., S. & W. Co., 100%
\$1.44 55%
Timmers' Hollow Punches, P., S. & W. Co. 20% 25%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Sawset and Punch—See Sawsets.

Rail—

Sliding Door, Wrt Brass 1000 1000 1000 1000
Sliding Door, Bronze Wrt Iron 1000 1000 1000 1000
Sliding Door, Iron, Painted 1000 1000 1000 1000
Barn Door, Light, 1000 1000 1000 1000
Per 100 feet 1000 1000 1000 1000
B. D. for N. E. Hanger 1000 1000 1000 1000

Rakes—

Cast Steel, Association 70% 70% 70% 70%
Cast Steel, outside g'ds 70% 70% 70% 70%
Malleable 70% 70% 70% 70%
Gibbs' Lawn Rake 70% 70% 70% 70%
Gibbs' Canton Lawn Rake 70% 70% 70% 70%
Gibbs' Acme Lawn Rake 70% 70% 70% 70%
Gibbs' Favorite Lawn Rake 70% 70% 70% 70%
Gibbs' Crown Lawn Rake, No. 1 70% 70% 70% 70%
Gibbs' Crown Lawn Rake, No. 2 70% 70% 70% 70%
Onondaga Lawn Rake 70% 70% 70% 70%
Fort Madison Prize Bow Brace and Peersless 65%
Fort Madison Steel Tooth Lawn Rake, 60.00 25%

Razors—

J. R. Torrey Razor Co. 20%
Westenhelm and Butcher, \$10 to 20 100%
Jordan's AAAI, new list 100%
Jordan's Old Faithful, new list 100%
Galvanic 100%
Electric Cutlery 100%
Campbell Cutlery Co. 50%

Razor Straps—

See Straps, Razor.

Rings and Ringers—**Bull Rings—**

Union Nut Co. 55%
Sargent's 75% 30%
Hotchkiss' low list 75% 30%
Humason, Beckley & Co.'s 70% 10%
Peck, Stow & W. Co.'s 50% 10% 50% 10%
Ellrich Hdw. Co., White Metal, low list, 50% 50% 10%

Hog—

Top of the Hill Rings 1000 1000 1000 1000
Top of the Hill Rings 1000 1000 1000 1000
Hill's Improved Rings 1000 1000 1000 1000
Hill's Old Style Rings 1000 1000 1000 1000
Hill's Tongs 1000 1000 1000 1000
Hill's Rings 1000 1000 1000 1000
Perfect Rings 1000 1000 1000 1000
Blair's Hog Rings 1000 1000 1000 1000
Blair's Hog Rings 1000 1000 1000 1000
Champion Rings 1000 1000 1000 1000
Champion Rings, Double 1000 1000 1000 1000
Brown's Rings 1000 1000 1000 1000
Electric Hog Rings 1000 1000 1000 1000
Electric Hog Rings 1000 1000 1000 1000
Major Rings 1000 1000 1000 1000
Major Rings 1000 1000 1000 1000

Rivets and Burrs—

Iron, list Nov. 17, '87 60% 10% 60% 10%
Copper 60% 10%
Coppered Iron, Bettina Brand 40%

Rivet Sets—See Sets.**Rods—**

Stair, Brass 25% 30%
Stair, Black Walnut 1000 1000 1000 1000

Rollers—

Barn Door, Sargent's list 60% 10% 10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%
Thompson Mfg. Co.'s Lawn Rollers 30%

Rope—The following prices are f.o.b., New York or factory, and are shaded 1/4% on large lots; terms, 1 1/2% for cash.

Manila, 7-10 in. diam. and larger 100%
Manila, 1/4 in. 100%
Manila, 1/2 and 5-16 in. 11%
Manila, Tarred Rope 9%
Manila, Hay Rope 9%
Sisal, 7-16 inch and larger 8%
Sisal, 1/4 in. 8%
Sisal, 1/2 and 5-16 in. 8%
Sisal, Hay Rope 7%
Sisal, Tarred Rope 7%
Sisal, Medium Lath Yarn 7%
New Zealand, 7-16 in. and larger 6%
New Zealand, 1/4 inch 7%
New Zealand, 1/2 and 5-16 inch 7%
New Zealand, Hay Rope 6%
New Zealand, Tarred Rope 6%
Cotton Rope 13% 10%
Jute Rope 6% 6% 7%

Wire—

List February, 1892. All kinds. 45%

Rules—

Boxwood 80% 10% 10%
Ivory 50% 10%
Starrett's Rules and Straight Edges, Steel 25% 10%

Sad Irons—See Irons, Sad.**Sand and Emery Paper and Cloth—**

See Paper and Cloth.

Sash Cord—See Cord, Sash.**Sash Locks—See Locks, Sash.****Sash Weights—**

See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.**Saws—**

The following prices are generally cut by jobbers.

Dixton's Circular 45% 45% 55%
Dixton's Cross Cut 45% 45% 55%
Dixton's Hand 25%
Woodrough & McParlin 25%
Hand, Panel and Rip 30% 30% 55%
Narrow Champion Cross Cuts with Handles, 1/2 foot 18% 20%
Champion Thin Back Cross Cuts, 1/2 foot 26% 28%
Champion Extra Thin Back Cross Cuts, 1/2 foot 26% 31%
One Man Champion Cross Cuts, 1/2 foot 37% 40%
Wheeler, Madsen & Clemson Mfg. Co. Hand, Panel and Rip 35% 35% 55%
Narrow Champion Cross Cuts with Handles, 1/2 foot 18% 20%
Champion Thin Back Cross Cuts, 1/2 foot 26% 28%
Champion Extra Thin Back Cross Cuts, 1/2 foot 26% 31%
One Man Champion Cross Cuts, 1/2 foot 37% 40%
Atkins' Circular Shingle & Heading 50%
Atkins' Silver Steel Diamond X Cuts 1000 1000 1000 1000
Atkins' Special Steel Dexter X Cuts 1000 1000 1000 1000
Atkins' Special Steel Diamond X Cuts 1000 1000 1000 1000
Atkins' Champion and Electric Tool X Cuts 1000 1000 1000 1000
Atkins' Hollow Back X Cuts 1000 1000 1000 1000
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, 1000 1000 1000 1000
Peace Circular and Mill 45% 45% 55%
Peace Hand Panel and Rip 25% 25% 55%
Peace Cross Cuts 45% 45% 55%
Richardson's Circular and Mill 45% 45% 55%
Richardson's X Cuts 45% 45% 55%
Richardson's Hand, &c. 25% 25% 55%
C. E. Jennings & Co. Hand, Panel and Rip 33% 33% 10%

Hack Saws—

Griffin's, complete 40% 10% 50%
Griffin's Hack Saw Blades 40% 10% 50%
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—

Lester, complete, \$10.00 25%
Rogers, complete, \$4.00 25%
Barnes' Builders' and Cab Makers' \$15.25 35%
Barnes' Scroll Saw Blades 35%

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Scales—**

Hatch, Counter, No. 171, good quality, 1000 1000 1000 1000
Hatch, Tea, No. 161 1000 1000 1000 1000
Union Platform, Plain 1000 1000 1000 1000
Union Platform, Striped 1000 1000 1000 1000
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Family Turnbells 30% 30% 10%
Riehle Bros.' Platform 40%

Scale Beams—

See Beams, Scale.

Scissors, Fluting 45%**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.) 100% 10%
Box, 1 Hand 1000 1000 1000 1000
Box, 2 Hand 1000 1000 1000 1000
Defiance Box and Ship 20% 10%
Foot 50% 10% 60%
Ship, Common 1000 1000 1000 1000
Ship, R. I. Tool Co. 1000 1000 1000 1000

Screen Window and Door Frames—See Frames**Screw Drivers—**

See Drivers, Screw.

Screws—**Bench and Hand—**

Bench, Iron 55% 10% 55% 10% 10%
Bench, Wood, Beech 1000 1000 1000 1000
Bench, Wood, Hickory 20% 10%
Hand, Wood 25% 10% 25% 10% 5%
Hand, Grand Rapids, list 35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890 75% 10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 75% 10%
Hand Rail, Sargent's 70% 10%
Hand Rail, H. & B. Mfg. Co. 70% 10% 75%
Hand Rail, Am. Screw Co. 75%

Jack Screws—

Jack Screws, Millers Falls list 50% 10%
Jack Screws, P., S. & W. 35%
Jack Screws, Sargent 70%
Jack Screws, Stearns 40% 40% 10%

Cork—

Humason & Beckley Mfg. Co. 40% 10% 50%
Williamson's 33% 33% 55%

Machine—

Flat Head Iron 65%
Round Head Iron 80%

Wood—

List January 1, 1891.

Flat Head Iron 70%
Round Head Iron 65%
Flat Head Brass 70%
Round Head Brass 65%
Flat Head Bronze 70%
Round Head, Bronze 65%
Rogers' Drive Screws 82% 4%

Scroll Saws—See Saws, Scroll.**Scythes—**

Grain 40% 5% 40% 10%
Grass 40% 10% 50%

Scythe Snaths—

See Snaths, Scythe.

Sets—**Awl and Tool—**

Alken's Sets, Awls and Tools, No. 20, 1000 1000 1000 1000
Fray's Adj. Tool Hds., Nos. 1, 1000 1000 1000 1000
No. 1, 1000 1000 1000 1000
No. 2, 1000 1000 1000 1000
No. 3, 1000 1000 1000 1000
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No. 99, 1000 1000 1000 1000
No. 100, 1000 1000 1000 1000

Nail—

Square 1000 1000 1000 1000
Round 1000 1000 1000 1000
Buck Bros 1000 1000 1000 1000
Cannon's Diamond Point 1000 1000 1000 1000

Rivet—

Regular list 1000 1000 1000 1000

Saw—

Stillman's Genuine 1000 1000 1000 1000

Stillman's Pattern, Hand, 1000 1000 1000 1000

Cross Cut, 1000 1000 1000 1000

Common Lever, 1000 1000 1000 1000

Morrill's No. 1, 1000 1000 1000 1000

No. 11, 1000 1000 1000 1000

Nos. 3 and 4, 1000 1000 1000 1000

No. 5, 1000 1000 1000 1000

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Snaps Harness &c.

Anchor (T. & S. Mfg. Co.)	65%
Fitch's (Bristol)	50&10%
Hotchkiss	10%
Andrews	50%
Sargent's Patent Guarded	70&10&10%
German, new list	40&10%
Covert	50&10&5&2%
Covert, New Patent	50&10&5&2%
Covert, New R. E.	60&10&5&2%
Covered Spring	60&10&10%
Cover's Saddlery Works' Triumph	35%

Snaths, Scythe-

List	50&50&5%
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Soldering Irons-

See Irons, Soldering.

Spittoons, Cuspidors, &c.**Standard Fiberware-**

Cuspidors, 8 1/4-inch, # doz., No. 5, #8; No. 5A, #9	
Spittoons, Daisy, 8-inch, No. 1, #4; 10 and 11 inch, #6	

Spoke Shaves-

See Shaves, Spoke.

Spoke Trimmers-

See Trimmers, Spoke.

Spoons and Forks-**Tinned Iron-**

Bartling, Cen. Stamp, Co.'s list	70&10%
Solid Table and Tea, Cen. Stamp, Co.'s list	
Buffalo, S. S. & Co.	35%

Silver Plated-

4 months or 5% cash 30 days:

Meriden Brit. Co., Rogers	40&15%
C. Rogers & Bros.	40&15%
Reed & Barton	40&15%
Wm. Rogers Mfg. Co.	40, 15&5%
Simpson, Hall, Miller & Co.	40, 15&5%
Holmes & Edwards Silver Co.	40, 15&5%
L. Boardman & Son	50&12&5%

Miscellaneous-

Holmes & Edwards Silver Co.	
No. 67 Mexican Silver	50&10&5%
No. 30 Silver Metal	50&10&5%
No. 24 German Silver	50&10&5%
No. 50 Nickel Silver	50&5%
No. 49 Nickel Silver	50&10&5%

Wm. Rogers Mfg. Co.

Rogers' Silver Metal

18% Rogers' German Silver

25% Rogers' Nickel Silver

German Silver, Hall & Elton

German Silver, Hall & Elton

Nickel Silver

Britannia

Boardman's Nickel Silver, list July 1, 1891

Boardman's Britannia Spoons, case lots

Spring-**Door-**

Torrey's Rod, 39 in.

Gray's, # gr. \$20.00

Bee Rod, # gr. \$20.00

Warner's No. 1, # doz \$1.50; No. 2, \$3.40

Gem (Coll.) list April 10, 1886

Star (Coll.) list April 10, 1886

Victor (Coll.)

Champion (Coll.)

Cowell's No. 1, # doz \$1.00; No. 2, \$1.50

Rubber, complete, # doz \$4.50

Hercules

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half

Cliff's Bolster Springs

Squares-

Steel and Iron

Nickel-Plated

Try Square and T. Bevels

Diston's Try Square and T. Bevels

Winterbottom's Try and Miter

Starrett's Micrometer Caliper Squares

Avery's Flush Bevel Squares

Avery's Bevel Protractor

Squeezers-**Fodder-**

Blair's

Blair's "Climax"

Lemon-

Porcelain Lined, No. 1

Wood, No. 2

Wood, Common

Dunlap's Improved

Sammis, No. 1, \$5.00; No. 2, \$12

Jennings' Star

The Boss

Dean's, Nos. 1, # doz \$8.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50

Little Giant

King

Hotchkiss Straight Flash

Silver & Co., Glass

Manny Lemon Juice Extractor

Standard

Improved

Standard Fiber Ware-

See Ware, Standard Fiber.

Staples-**Blind-**

Barbed, 1/4 in. and larger

Barbed, 1/4 in.

Fence Staples, Galvanized

Fence Staples Plain

Steelyards**Stocks and Dies-**

Blacksmith's

Waterford Goods

Butterfield's Goods

Lightning Screw Plate

Reece's New Screw Plates

Reversible Ratchet

Gardner

Green River

Stops, Bench-

Morrill's	# doz \$9, 50%
Hotchkiss's	# doz \$5, 10&10%
Weston's, No. 1, #10; No. 2, #8, 25&10&5%	
McGill's	# doz \$3, 10%
Cincinnati	25&10%
Terrell's Nos. 1 and 2, # doz. \$3; No. 3, \$3.60	

Stone-**Sythe Stones-**

Pike Mfg. Co., list April, 1892

Cleveland Stone Co., list Nov. 1892

Oil Stones, &c.

Pike Mfg. Co.

Hindostan No. 1, # doz. 8¢

Sand Stone, 4 to 8 in.

Turkey Oil Stone, 4 to 8 in.

Turkey Slips

Washita Stone, Extra

Washita Stone, No. 1

Washita Stone, No. 2

Washita Slips, Extra

Washita Slips, No. 1

Arkansas Stone, No. 1, 3 to 6 in.

Arkansas Stone, No. 1 1/2 to 8 in.

Lake Superior

Lake Superior Slips

Stove Polish-

See Polish, Stove.

Stretchers Carpet-

Cast Steel, Polished

Cast Iron, Steel Points

Socket

Bullard's

Strops, Razor-

Genuine Emerson

Imitation

Torrey's

Badger's Belt and Com.

Lamont Combination

Jordan's Pat. Padded, list Nov. 1, '89, 50%

Electric Cutlery Co.

Campbell Cutlery Co.

Stuffer or Fillers, Sausage-

Miles' Challenge, # doz \$20, 50&50&5%

Perry, # doz, No. 1, \$15.00; No. 0, \$21.00

Draw Cut No. 4, each \$30.00

Enterprise Mfg. Co.

Silver's

Sweepers, Carpet and Lawn-

Bissell No. 5

Bissell, Grand

Standard

Domestic

Domestic, No. 2

Grand Rapids

Crown Jewel, No. 1, \$18.00; No. 2, \$19.00

Magic

Improved Parlor Queen

Nickel

Japanned

Excelsior

Garland

Parlor Queen

Housewife's Delight

Queen

Queen, with band

King

Weed, Improved

Hub

Cog Wheel

Ladies' Friend

Ladies' Friend No. 2

Advance

Our Leader

Triumph

Goshen

Supreme

Easy

Gilt Edge

Acme

Imperial

Grand Republic

Banner

The Star

Reliable

The Rapid

Our Own

Model

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:

5 dozen in 6 months

10 dozen in 6 months

25 dozen in 6 months

Except on L.F., when 10 dozen price is \$13.50, and 25 dozen \$18.00.

Lawn-

Thompson Mfg. Co.

Tacks, Brads &c.

List October 10, 1889. Old established straight weights. Short weight goods are sold at lower prices.

Carpet Tacks

American, Blued

American, Tin'd and Cop'd

Steel, Bright and Blued

Steel, Tinned and Coppered

Swedes Iron, Blued

Swedes Iron, Tinned

American Iron Tacks, Domestic

Swedes Iron Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Basket and Trimmers' Tacks

Lanc.

S. S.

Hungarian Nails

Common and Patent Brads

Leathered Tacks

Brush Tacks, S. S.

Looking Glass Tacks, S. S.

Leathered Tacks

Finishing Nails

Trunk and Clout Nails

Black

Tinned or Coppered

Basket Nails

Chair Nails

Cigar Box Nails

Tin Capped Nails

Miscellaneous-

Double Point	90&90&10%
Wire Carpet Nails	50&10%
Plymouth Rock Steel Carpet Tacks	25%
Upholsterers' Nails	40%

Wire Brads and Nails-

Steel-Wire Brads, R. & E. Mfg. Co.'s list

See also Nails, Wire.

Tapes, Measuring-

American

Spring

Chesterman's, Regular list

Thermometers-

Tin Case

Thimble Skeins-See Skeins.**Ties, Bale-Steel.**

Standard Wire, list

Tinners' Shears, &c -

See Shears, Tinners' &c.

Tinware-

Stamped, Japanned and Pieced, list Jan 20, 1887

Tire Benders, Upsetters, &c.-See Benders and Upsetters, Tire.**Tools-****Coopers'-**

Bradley's

Barton's

L. & J. White

Albertson Mfg. Co.

Beatty's

Sandusky Tool Co.

Shaves Cincinnati Tool Co.

Lumber-

Ring Peavies, "Blue Line"

Ring Peavies, Common

Steel Socket Peavies

Mail Iron Socket Peavies

Cant Hooks, "Blue Line"

Cant Hooks, Common Finish

Cant Hooks, Mail Socket Clasp, "Blue Line" Finish

Cant Hooks, Mail Socket Clasp, Common Finish

Cant Hooks, Clip Clasp, "Blue Line" Finish

Cant Hooks, Clip Clasp, Common Finish

Hand Spikes

Pike Poles, Pike & Hook

Pike Poles, 14 ft.

Pike Poles, 16 ft.

Pike Poles, 18 ft.

Pike Poles, 20 ft.

Pike Poles, 22 ft.

Pike Poles, 24 ft.

Pike Poles, 26 ft.

Pike Poles, 28 ft.

Pike Poles, 30 ft.

Pike Poles, 32 ft.

Pike Poles, 34 ft.

Pike Poles, 36 ft.

Pike Poles, 38 ft.

Pike Poles, 40 ft.

Pike Poles, 42 ft.

Pike Poles, 44 ft.

Pike Poles, 46 ft.

Pike Poles, 48 ft.

Pike Poles, 50 ft.

Pike Poles, 52 ft.

Pike Poles, 54 ft.

Pike Poles, 56 ft.

Pike Poles, 58 ft.

Pike Poles, 60 ft.

Pike Poles, 62 ft.

Pike Poles, 64 ft.

Pike Poles, 66 ft.

Pike Poles, 68 ft.

Pike Poles, 70 ft.

Pike Poles, 72 ft.

Pike Poles, 74 ft.

Pike Poles, 76 ft.

Washers—
Size hole..... 5-16 3/4 1/2 3/4 to 1 1/2
Washers..... 5 1/2 4 1/2 3 1/2 2 1/2
In lots less than 200 lb., add 1/4¢, 5-20
boxes 1¢ to list.
Washer Cutters—
See Cutters, Washers.
Wedges—
Iron..... 1/2 lb 3/4¢
Steel..... 1/2 lb 3/4¢
Weights, Sash—
Scild Eyes..... 1/2 ton \$18.00 \$19.00
**Well Buckets Galvan-
ized—**See Buckets, Well, Gal-
vanized.
Wheels, Well—
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25
Wire and Wire Goods—
Iron—
Br. & Ann., Nos. 0 to 18.....
75¢ to \$1.00
Cop'd, Nos. 0 to 18, 75¢ to \$1.00
Galv., Nos. 0 to 18.....
70¢ to \$1.00
Tin'd, Tin'd list, Nos. 0
to 18..... 70¢ to \$1.00
Extra 10%
often given.

Stone,
Br. and Ann'd, Nos. 16
to 18..... 80%
Bright and Ann'd, Nos.
19 to 20..... 80%
Br. and Ann'd, Nos. 27
to 36..... 82%
Tinned.....
Tinned Broom Wire, 18 to 21, 1/2 lb..... 4 1/2¢
Galvanized Fence..... 75¢ to \$1.00
Brass, list Jan. 18, 1884..... 40%
Copper, list Jan. 18, 1884..... 60%
Annealed Wire on Spools..... 60%
Maltin's Steel and Tin'd on Spools..... 60%
Maltin's Brass and Cop. on Spools..... 50%
Tate's Spooled, Tin'd & Annealed..... 60%
Tate's Spooled Cop. and Brass..... 50%
Cast Steel Wire..... 50%
Stub's Steel Wire..... 30%
Steel Music Wire, 12 to 30, imported..... 60%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.
Bright Wire Goods—
Standard list..... 80¢ to \$1.00

Wire Cloth and Netting—
Painted Screen Cloth, good quality,
100 sq. ft., \$1.40
Galvanized Wire Netting..... 75¢ to \$1.00
Wire, Barb—
See Trade Report.
Wire Rope—See Rope, Wire.
Wrenches—
American Adjustable..... 40%
Baxter's Adjustable "S"..... 40%
Baxter's Diagonal..... 60%
Coe's "Mechanics"..... 50%
Coe's "Genuine"..... 50%
Girard Standard..... 65%
Lamson & Sessions' Engineers'..... 60%
Lamson & Sessions' Standard..... 70%
P. S. W. Agricultural..... 75%
Girard Agricultural..... 75%
Lamson & Sessions' Agric'l..... 75%
Bemis & Call's:
Pat. Combination..... 40%
Merrick's Pattern..... 35%
Briggs's Pattern..... 25%
Cylinder or Gas Pipe..... 40%
No. 3 Pipe..... 50%

Aiken's Pocket (Bright)..... \$6.00, 50¢ to 10¢
The Favorite Pocket..... 1/2 doz., \$4.00, 25¢
Webster's Pat. Combination..... 25¢
Boardman's..... 25¢
Always Ready..... 25¢
Alligator..... 50¢
Donohue's Engineer..... 20¢ to 10¢
Acme, Bright..... 50¢ to 25¢
Acme, Nickel..... 40¢ to 25¢
Hercules..... 70¢ to 50¢
Walker's..... 55¢ to 35¢
Diamond Steel..... 25¢ to 10¢
Cincinnati Brace Wrenches..... 25¢ to 10¢
Taft's Vise Wrench..... 55¢ to 35¢

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '92..... 25¢ cash
Colby Wringer Co., list Sept. 1, '91..... 25¢ cash
Corvett Mfg. Co., list Jan. 1, 1892..... 25¢ cash
Peerless Mfg. Co., list Feb., 1892..... 25¢ cash
National Wringer & Mfg. Co., list
June 1, 1892..... 25¢ cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892
85¢ to 10¢ to 20¢

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw, per gal. 46
Linseed, City, boiled..... 49
Linseed, Western, raw..... 46
Lard, City, Extra Winter..... 86
Lard, City, Prime..... 87
Lard, City, Extra No. 1..... 85
Lard, City, No. 1..... 45
Lard, Western, prime..... 85
Cotton-seed, Crude, prime..... 37
Cotton-seed, Crude, off
grades..... 33
Cotton-seed, Summer Yel-
low, prime..... 40
Cotton-seed, Summer Yel-
low, off grades..... 36
Sperm, Crude..... 68
Sperm, Natural Spring..... 67
Sperm, Bleached Spring..... 72
Sperm, Natural Winter..... 73
Sperm, Bleached Winter..... 78
Whale, Crude..... 43
Whale, Natural Winter..... 52
Whale, Bleached Winter..... 55
Whale, Extra Bleached..... 57
Sea Elephant, Bleached
Winter..... 33
Menhaden, Crude, Sound..... 37
Menhaden, Crude, Southern..... 37
Menhaden, Light Pressed..... 41
Menhaden, Bleached W'ter..... 42
Menhaden, Extra Bleached..... 41
Tallow, City, prime..... 50
Tallow, Western, prime..... 45
Coconut, Ceylon..... 54
Coconut, Cochila..... 38
Cod, Domestic..... 42
Cod, Foreign..... 42
Red Elaine..... 36
Red Saponified..... 14
Bank..... 35
Strait..... 36
Olive, Italian, bbls..... 64
Neatsfoot, prime..... 50
Palm, prime, Lagos..... 54
Mineral Oils—
Black, 29 gravity, 25 to 30
cold test..... per gal 7
Black, 29 gravity, 15 cold
test..... 7 1/2
Black, 29 gravity, summer..... 6
Cylinder, light, filtered..... 14

Cylinder, dark, filtered..... 10
Paraffine, 23 1/2 to 24 gravity..... 11 1/2
Paraffine, 25 gravity..... 10 1/2
Paraffine, 28 gravity..... 8
Paraffine, red..... 9

Paints and Colors—

Barytes, Foreign, 10 ton..... \$22.00
Barytes, Amer. floated..... \$20.00
Barytes, Amer. No. 1..... \$16.00
Barytes, Amer. No. 2..... \$13.00
Barytes, Amer. No. 3..... \$11.00
Blue, Celestial..... 6
Blue, Chinese..... 40
Blue, Prussian..... 25
Blue, Ultramarine..... 8
Brown, Spanish..... 3
Brown, Vandyke, Amer..... 3
Brown, Vandyke, English..... 6
Carmine, No. 40, in bulk..... 3.10
Carmine, No. 40, in boxes
or barrels..... 3.20
Carmine, No. 40, in ounce
bottles..... 4.20
Chalk, in bulk..... 1.75
Chalk, in bbls., 100 lb..... 33
China Clay, English..... 13
Cobalt Oxide, prep'd..... 9.00
Cobalt Oxide, black..... 1.90
Cobalt Oxide, black..... 1.90
less 100 lb. 1.90
Green, Paris, in bulk..... 13
Green, Paris, 170 to 175 lb
kegs..... 14
Green, Paris, small pack..... 15
Green, Chrome, ordinary..... 6
Green, Chrome, pure..... 22
Lead, Eng., B.B. white..... 8
Lead, Ann. White, dry or in oil..... 8
Kegs, lots less than 500 lb..... 7 1/4
Kegs, lots 500 lb to 5 tons..... 6 1/2
Kegs, lots 5 tons to 12 tons..... 6 1/4
Kegs, lots 12 tons and over..... 6 1/2
Lead, White, in oil, 25 lb tin
pails, add to keg price..... 1
Lead, White, in oil, 1 to 5 lb as-
sorted tins, add to keg price..... 1
Lead, Red, bbls. and 1/2 bbls..... 6 1/4
Lead, Red, kegs..... 6 1/4
Litharge, kegs..... 6 1/4
Litharge, bbls. and 1/2 bbls..... 6 1/4

TERMS, &c.—Lead and Litharge.—On
lots of 500 lb or over, 60 days' time or 2 1/2
% discount for cash if paid within 15 days
of date of invoice.
Ocher, Rochelle..... 1.35
Ocher, French Washed..... 1 1/2
Ocher, German Washed..... 1 1/2
Ocher, American..... 1 1/2
Orange Mineral, English..... 8 1/2
Orange Mineral, French..... 10
Orange Mineral, German..... 8 1/2
Orange Mineral, American..... 8 1/2
Paris White, English Cliff-
pkins..... 1.00
Paris White, American..... 1.00
Red, Indian, English..... 5 1/2
Red, Indian, American..... 2
Red, Turkey..... 9
Red, Tuscan..... 9
Red, Venetian, American..... 100 lb 1.00
Red, Venetian, English..... 1.20
Sienna, Italian, Burnt and
Pow'd..... 4
Sienna, Ital., Burnt Lumps..... 1 1/2
Sienna, Ital., Raw, Pow'd..... 4 1/2
Sienna, Ital., Raw, Lumps..... 1 1/2
Sienna, American, Raw..... 1 1/2
Sienna, American, Burnt and
Pow'd..... 1 1/2
Talc, French..... 1 1/2
Talc, American..... 1 1/2
Terra Alba, Fr'ch, 100 lb..... 95
Terra Alba, English..... 70
Terra Alba, American No. 1..... 65
Terra Alba, American No. 2..... 45
Umber, Turkey, Burnt and
Pow'd..... 3 1/2
Umber, Turkey, Raw and
Pow'd..... 2 1/2
Umber, Turkey, R'w Lumps..... 2 1/2
Umber, Turkey, Bnt. Amer..... 1 1/2
Yellow, Chrome..... 10
Vermilion, American Lead..... 11 1/2
Vermilion, Quicks'cr, bulk..... 57
Vermilion, Quicks'cr, bags..... 58
Vermilion, Quicksilver sm'r
pkgs..... 62
Vermilion, English Import..... 85
Vermilion, Imitation, Eng..... 8
Vermilion, Trieste..... 90
Vermilion, Chinese..... 92
Whiting Common, 100 lb..... 37 1/2
Whiting Gilders..... 45

Zinc, American, dry..... 4 1/2
Zinc, French, Red Seal..... 7 1/2
Zinc, Fre ch, Green Seal..... 9
Zinc, Fre ch, V. M. X..... 7
Zinc, Antwerp, Red Seal..... 7 1/2
Zinc, Antwerp, Green Seal..... 7 1/2
Zinc, German, L. Z. O..... 6 1/2
Zinc, V. M. in Poppy Oil, 6
Seal, lots of 1 ton and
over..... 10 1/2
lots less than one ton..... 11
Zinc, V. M. in Poppy Oil,
Red Seal..... 11
lots of 1 ton and over..... 10 1/2
lots of less than 1 ton..... 10 1/2
Discounts.—French Zinc.—Discounts to
buyers of 10 bbl. lots of one or assorted
grades, 15; 25 bbls., 2%; 50 bbls., 4%. No
discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort..... 25
Black, Drop, English..... 12
Black, Drop, Domestic..... 7
Black, Lampblack, Best..... 20
Black, Lampblack, Common..... 7
Black, Ivory..... 8
Blue, Chinese..... 35
Blue, Prussian..... 20
Blue, Ultramarine..... 12
Brown, Vandyke..... 7
Green, Chrome..... 8
Green, Paris..... 16
Sienna, Raw..... 7
Sienna, Burnt..... 7
Umber, Raw..... 7
Umber, Burnt..... 7

Putty—

In barrels and 1/2 bbls..... .01 1/2
In tubs..... .01 1/2
In tin cans..... .01 1/2
In bladders..... .01 1/2

Spirits Turpentine—

In regu bbls..... 31 1/2
In machine bbls..... 32

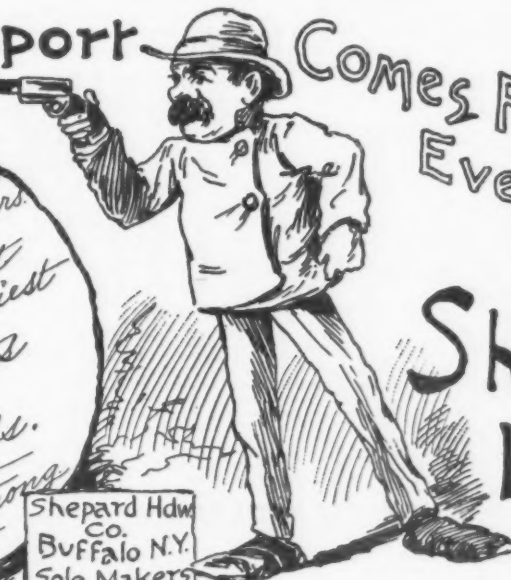
Glue—

Low Grade..... 8
Cabinet..... 12
Medium White..... 13
Extra White..... 17
French..... 10
English..... 10
Irish..... 12

A Good Report Comes From Every One Who Uses A Shepard Lightning Freezer.

Have More Patented Improvements Than Any Other Freezers. Freeze The Quickest And Run The Easiest. All Inside Parts Tinned. Cedar Tubs. Extra Strong.

Shepard Hdw Co. Buffalo N.Y. Sole Makers



Pacific Coast Representatives, CHAS. L. PIERCE & CO., 202 Market St., SAN FRANCISCO, CAL.

Canadian Representative, H. D. SIMMONS, 74 York St., TORONTO, ONT.

CURRENT METAL PRICES.

DECEMBER 21, 1892.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common iron:	
1 to 2 in. round and square..	\$ 1.90 @ 2.00
1 to 6 in. x 1/2 to 1 in.	
Refined Iron:	
1 to 2 in. round and square..	\$ 2.00 @ 2.10
1 to 4 in. x 1/2 to 1 in.	
1 to 6 in. x 1/2 and 5-16.....	\$ 2.20 @ 2.30
Rods—1/2 and 1-16 round and sq.	\$ 2.10 @ 2.20
Bands—1 to 6 x 3-16 to No. 12..	\$ 2.30 @ 2.40
"Burden Best" Iron, base price..	\$ 3.00
Burden's "H. B. & S." Iron,	
base price.....	\$ 2.80
"Uster".....	\$ 3.00
Norway Bars.....	\$ 3.75 @ 4.00
Norway Shapes.....	\$ 4.50 @ 5.00

Merchant Steel from Store—

Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base	
price in small lots.....	2 3/4
Best Cast Steel, base price in small lots.	8
Best Cast Steel Machinery, base price in	
small lots.....	5

Sheet Iron from Store—

Black	Common R. G. Cleaned	American.
Nos. 10 to 16.....	\$ 3 @	3 3/4
17 to 20.....	\$ 3 1/2 @	3 3/4
21 to 24.....	\$ 3 3/4 @	3 3/4
25 and 26.....	\$ 3 3/4 @	3 3/4
27.....	\$ 3 3/4 @	3 3/4
28.....	\$ 3 3/4 @	3 3/4
American B. B.....	\$ 4 @	4 1/4

Galvanized Sheet Iron—

Nos. 10 to 16.....	\$ 4.20
17 to 20.....	\$ 4 1/2
21 to 24.....	\$ 4 3/4
25 to 26.....	\$ 5
27.....	\$ 5 1/4
28.....	\$ 5 3/4
29 to 30.....	\$ 6 1/4

Genuine Russia, according to	
assortment.....	\$ 12 @ 13
Patent Planished.....	\$ 10 @ 11
Craig Polished Sheet Steel.....	\$ 8 1/2

English Steel from Store—

Best Cast.....	\$ 10 1/2 @ 17
Swaged Cast.....	\$ 16
Best Double Shear.....	\$ 15
Blister, 1st quality.....	\$ 12
German Steel, Best.....	\$ 10
2d quality.....	\$ 9
3d quality.....	\$ 8
Sheet Cast Steel, 1st quality.....	\$ 15
2d quality.....	\$ 14
3d quality.....	\$ 13 1/2
R. Mushet's "Special".....	\$ 48
" " "Titanic".....	\$ 75
" " "Titanic".....	\$ 20

METALS—

Barca, Pig.....	Per lb
Straits, Pig.....	21 3/4
Straits in Bars.....	23

Tin Plates—

Duty: 2 1/2 % D.	
Charcoal Plates—Bright—	
Guaranteed Plates command special prices,	
according to quality.....	Per box.
Melny and Calland Grade IC, 10 x 14.....	\$ 6.50
" " " " IC, 12 x 12.....	6.75
" " " " IC, 14 x 20.....	6.50
" " " " IC, 20 x 28.....	13.00
" " " " IX, 10 x 14.....	8.50
" " " " IX, 12 x 12.....	8.75
" " " " IX, 14 x 20.....	8.50
" " " " IX, 20 x 28.....	17.00
" " " " DC, 12 1/2 x 17.....	6.00
" " " " DX, 12 1/2 x 17.....	8.00
Allaway Grade.....	Per box.
" " " " IC, 10 x 14.....	6.00
" " " " IC, 12 x 12.....	6.25
" " " " IC, 14 x 20.....	6.00
" " " " IC, 20 x 28.....	12.00
" " " " IX, 10 x 14.....	7.50
" " " " IX, 12 x 12.....	7.75
" " " " IX, 14 x 20.....	7.50
" " " " IX, 20 x 28.....	15.00
" " " " DC, 12 1/2 x 17.....	5.50
" " " " DX, 12 1/2 x 17.....	7.00

Coke Plates—Bright—

Steel Coke.—IC, 10 x 14, 14 x 20.....	\$ 5.50
10 x 20.....	8.50
20 x 28.....	11.50
IX, 10 x 14, 14 x 20.....	7.00
BV Grade.—IC, 10 x 14, 14 x 20.....	5.50

Charcoal Plates—Terne—

Guaranteed Plates command special prices	
according to quality.....	Per box.
Dean Grade.—IC, 14 x 20.....	\$ 5.75
20 x 28.....	11.00
IX, 14 x 20.....	6.50
20 x 28.....	13.00
Abecarne Grade.—IC, 14 x 20.....	5.65
20 x 28.....	11.00
IX 14 x 20.....	6.50
20 x 28.....	13.00

Tin Boiler Plates—

IX, 4 x 20.....	112 sheets.....	\$ 13.35
IX, 14 x 20.....	112 sheets.....	14.50
IX, 14 x 31.....	112 sheets.....	16.00

American Terne Plates.—Apollo.

IC, 14 x 20.....	\$ 6.25
IC, 20 x 28.....	12.50
IX, 14 x 20.....	7.25
IX, 20 x 28.....	14.50

Copper—

DUTY: Pig, Bar and Ingot, 1 1/2 %; Old Copper, 1 %
 D. Manufactured (including all articles of
 which copper is a component of chief value),
 35 % ad valorem.

Ingot—

Lake.....	@ 13
Ansonia grade Arizona.....	@ 12 1/2
Ansonia grade Casting.....	@ 12

Sheet and Bolt—

Prices adopted by the Association of Copper
 Manufacturers of the United States, May
 19, 1892. Subject to a discount of 10 % @ 20 %,
 according to size of order.

Not wider than	Not longer than	And longer than	Weights per sq. foot and prices per pound.							
			Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	23	24	25	26	30	
30	72		22	22	23	24	25	26	30	
36	96		22	22	23	24	25	26	30	
36	96		22	22	23	24	25	26	30	
48	96		22	22	23	24	25	26	30	
48	96		22	22	23	24	25	26	30	
60	96		22	22	23	24	25	26	30	
60	96		22	22	23	24	25	26	30	
84	96		22	22	23	24	25	26	30	
84	96		22	22	23	24	25	26	30	
Over 84 in. wide			25	27						

Bolt Copper, 3/4 inch diameter and over, per

round.....
 Circles, Segments and Pattern Sheets, 60 in.
 diameter and less, 3/4 % D advance over prices
 of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 60
 in. diameter, up to 96 in. diameter inclusive,
 1/4 % D advance over prices of Sheet Copper
 required to cut them from.

Circles, Segments and Pattern Sheets, over 96
 in. diameter, 5/8 % D advance over prices of
 Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. square
 foot and heavier, 1 1/2 % D over the foregoing
 prices.

Cold or Hard Rolled Copper lighter than 14 oz.
 square foot, 2 1/2 % D over the foregoing
 prices.

All Polished Copper over 20 in. wide, 2 1/2 % D
 advance over the foregoing prices.

Copper Bottoms, Pits and Flats—
 Per lb.
 14 ounce to square foot and heavier..... 20
 12 ounce and up to 14 ounce to square foot..... 27
 10 ounce and up to 12 ounce..... 29
 Lighter than 10 ounce..... 32
 Circles less than 8 inches diameter, 2 1/2 % D additional.

Circles over 13 inches diameter are not classed
 as Copper Bottoms.

10 % @ 20 % discount, according to size of order.
 Copper Wash Bowl Bottoms—
 Tinned..... 34, 10 % @ 20 %
 Net.

Tinning sheets on one side, 10, 12 and 14 x 48
 each..... 8
 Tinning sheets on one side, 30 x 60 each..... 30
 For tinning boiler sizes, 9 in. (sheets 14 in. x 60
 in.), each..... 15
 For tinning boiler sizes, 8 in. (sheets 14 in. x 56
 in.), each..... 12
 For tinning boiler sizes, 7 in. (sheets 14 in. x 52
 in.), each..... 12
 Tinning sheets on one side, other sizes, per
 square foot..... 2 1/4
 For tinning both sides double the above prices.

Planned Brass and Copper—
 Not larger than 30 x 60.
 16 oz. and heavier..... 24 1/2 @ 25
 14 oz..... 25 1/2 @ 26
 12 oz..... 27 1/2 @ 28

Seamless Brass Tubes—
 July 6, 1892. Net.

O. G.	N. G.	1/2	3/4	1	1 1/2	2	3	4
8-14	6-12	32	28	25	24	23	22	19
15	13	33	29	26	25	24	23	20
16	14	34	30	27	26	25	24	20
17	15	35	30	27	26	25	24	21
18	16	37	31	29	27	26	25	22
19	17	38	32	30	29	28	27	24
20	18-19	39	34	32	31	30	29	26
21	20	41	36	34	33	32	31	29
22	21	43	37	35	34	33	32	31
23	22	45	39	37	36	35	34	34
24	23	48	41	40	38	36	35	36
25	24	51	44	41	40	39	38	40

Copper, Bronze and Gilding Tube, 3/8 % D additional
 Braze Brass Tubing. (To No. 20 inclusive.)
 Above 5-16 inch to 3 inch, inclusive..... 35
 Plain, above 3 inch..... 45
 Plain, 5-16 inch..... 45
 Plain, 3/8 inch..... 60
 Plain, 1/2 inch..... 81
 Fancy Tubing, Brass, to No. 20, inclusive..... 43
 Bronze Tubing, 3/8 % D more than Brass.
 Discount from list..... 50 @ 55

Roll and Sheet Brass—
 (Brown & Sharpe Standard Gauge.)

Common High Brass:	in.	in.	in.	in.	in.	in.	in.
Wider than	10	12	14	16	18	20	24
To No. 20, inclusive.....	31	22	23	25	27	29	31
Nos. 21, 22, 23 and 24.....	32	23	24	26	28	30	32
Nos. 25 and 26.....	33	24	25	27	29	31	33
Nos. 27 and 28.....	34	25	26	28	30	32	34

Common High Brass:	in.	in.	in.	in.	in.	in.	in.
Wider than	24	26	28	30	32	34	36
and including	26	28	30	32	34	36	40
To No. 20, inclusive.....	36	39	42	46	50	55	60
Nos. 21, 22, 23 and 24.....	37	40	43	47	51	56	61
Nos. 25 and 26.....	38	41	44	48	52	57	62
Nos. 27 and 28.....	39	42	45	49	53	58	63

Discount from List 10 % to 25 %.

Brass and Copper Wire—

List January 17, 1894.

Numbered by Stubbs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive.....	\$0.22	\$0.24	\$0.26	\$0.30
No. 17 and No. 18.....	.23	.25	.27	.31
No. 19 and No. 20.....	.24	.26	.28	.32
No. 21, or 0.032 diameter.....	.25	.27	.29	.33

Discount 10 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22.....	\$0.26	\$0.28	\$0.30	\$0.34
No. 23.....	.28	.30	.32	.36
No. 24.....	.30	.32	.34	.38
No. 25.....	.32	.34	.36	.40
No. 26.....	.35	.37	.39	.43
No. 27.....	.38	.40	.42	.46
No. 28.....	.42	.44	.46	.51
No. 29.....	.45	.47	.49	.54
No. 30.....	.48	.50	.52	.57
No. 31.....	.51	.53	.55	.60
No. 32.....	.55	.57	.59	.63
No. 33.....	.60	.61	.63	.68
No. 34.....	.64	.66	.68	.73
No. 35.....	.70	.72	.74	.79
No. 36.....	.76	.78	.80	.85
No. 37.....	1.00	1.02	1.04	1.10
No. 38.....	1.30	1.32	1.34	1.40
No. 39.....	2.00	2.02	2.04	2.10
No. 40.....	2.60	2.62	2.64	2.70

— % discount.

Spring Wire, 2 1/2 % D advance.

Copper Belt and Hose Rivets and

Burrs—

Per lb.	No. 11.....	Per lb.
No. 5.....	49	50
No. 6.....	49	50
No. 7.....	49	50
No. 8.....	50	51
No. 9.....	52	53
No. 10.....	54	55

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, etc.
 1/2 to 3/4 inches inclusive..... 17 1/2 @ 18
 Over 3/4 to 5 inches inclusive..... 18 1/2 @ 19
 Pattern Rods, Finished True, Smooth and Straight.
 1/2 to 3/4 inches inclusive..... 18 1/2 @ 19
 Over 3/4 to 5 inches inclusive..... 19 1/2 @ 20

Duty: Pig, Bars and Plates, 1.50 @ 100 D.
 Western Spelter..... 5 1/4
 Bertha (pure)..... 8 1/4

Spelter—

Duty: Sheet, 2 1/2 % D.
 600 lb casks..... 7
 Per lb..... 7 1/4

Zinc—

Duty: Sheet, 2 1/2 % D.
 600 lb casks..... 7
 Per lb..... 7 1/4

Lead—

Duty: Pig, 3/4 @ 100 D. Old Lead, 3/4 % D. Pipe
 and Sheets, 2 1/2 % D.
 American Pig..... 4 1/2
 Bar..... 4 1/4
 Pipe, subject to discount 20 %..... 3 1/4
 Tin-lined Pipe, subject to discount 20 %..... 3 1/4
 Block Tin Pipe, subject to discount 20 %..... 3 1/4
 Sheet, subject to discount 20 %..... 3 1/4
 Old Lead in exchange, 3/4 % D.

1/2 @ 1/2 (Guaranteed)..... 13 1/2 @ 14
 No. 1..... 11 1/2 @ 12
 Prices of Solder indicated by private brands
 vary according to composition.

Cookson..... 12 1/2 @ 13
 Hallett's..... 11

Solder—

Over 98 % pure..... 11 1/2 @ 12
 94 % @ 98 % pure..... 11 1/2 @ 12

Antimony—

Prices per Ton.
 Duty: 15 % D.
 Over 98 % pure..... 75
 94 % @ 98 % pure..... 65

Old Metals—

Prices Paid in New York.
 Heavy Copper..... 10
 Light and Tinned Copper..... 9
 Heavy Brass..... 7
 Light Brass..... 6
 Lead..... 3 1/4
 Tea Lead..... 3 1/4
 Zinc..... 14
 No. 1 Pewter.....